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MAY 1955

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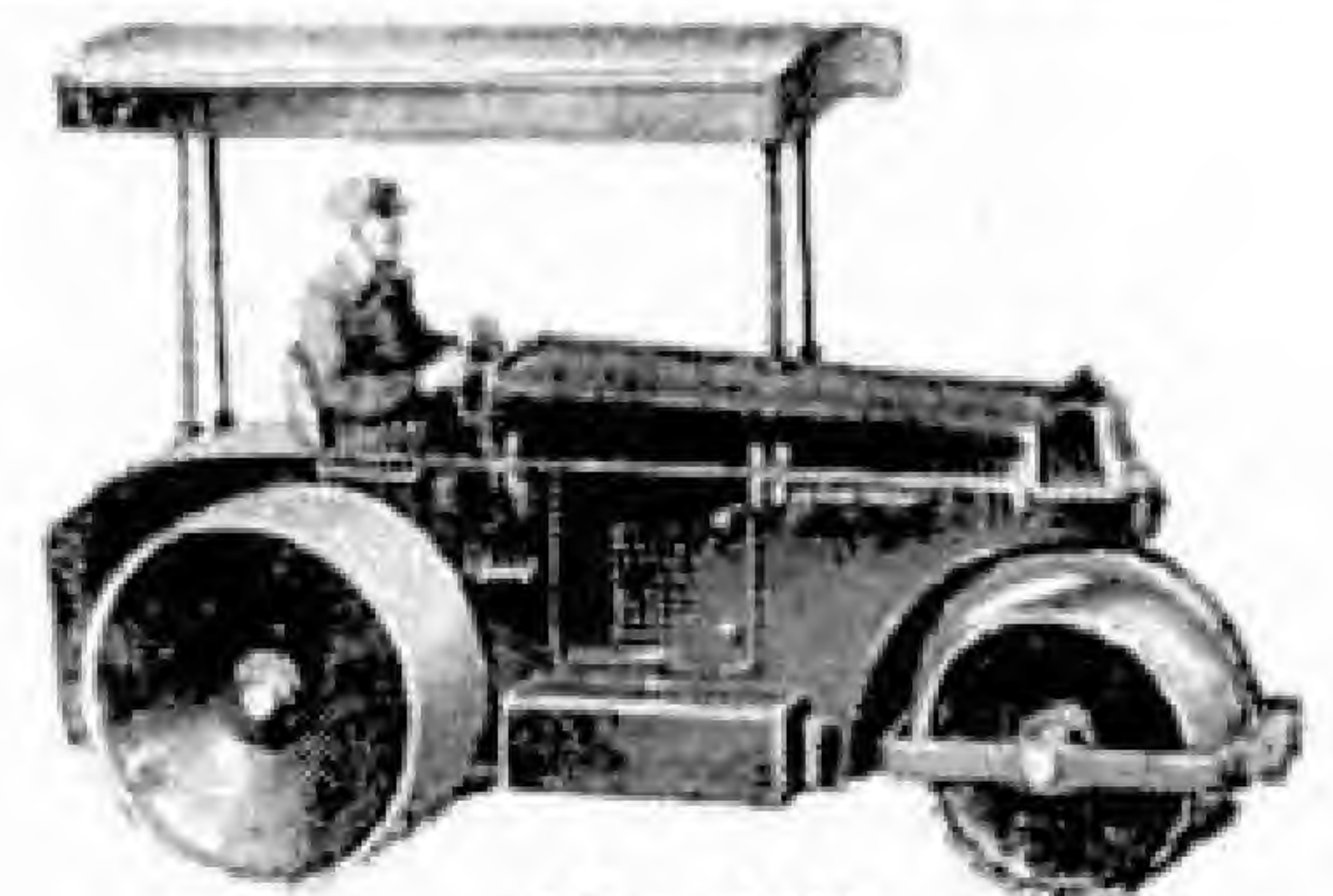
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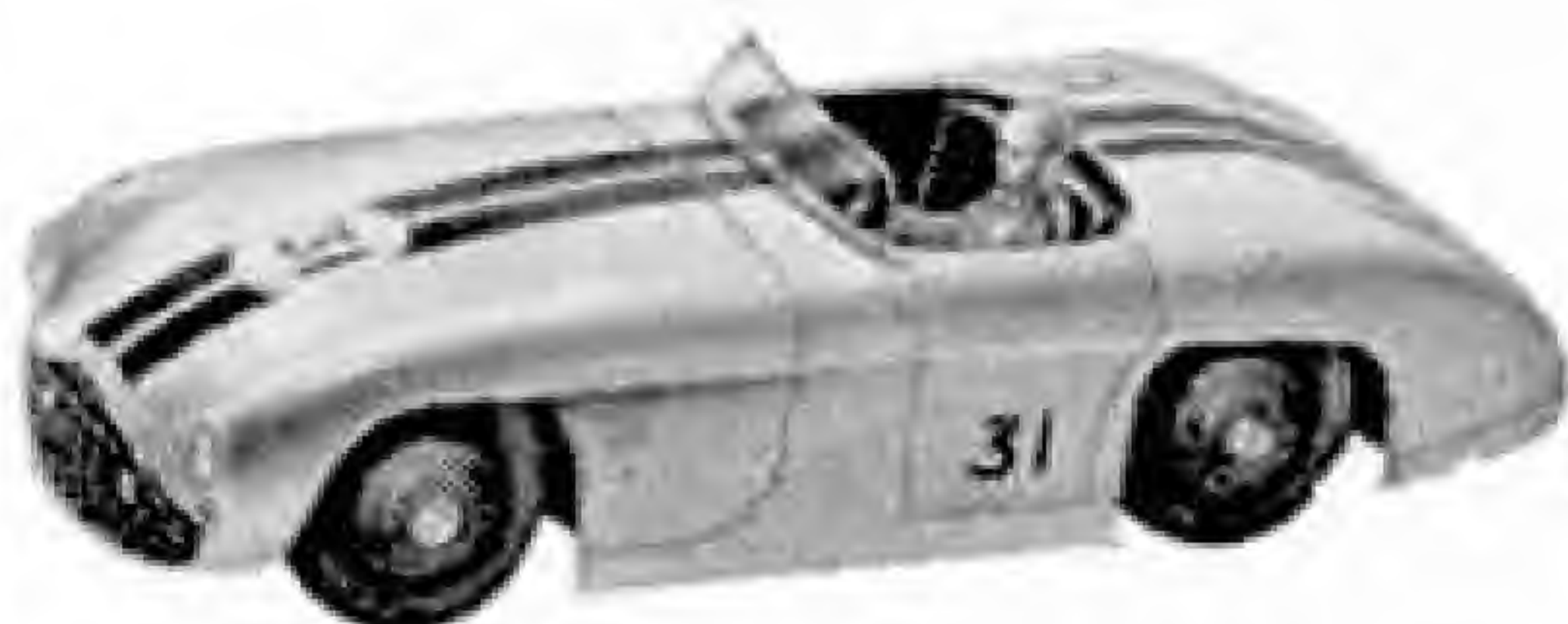
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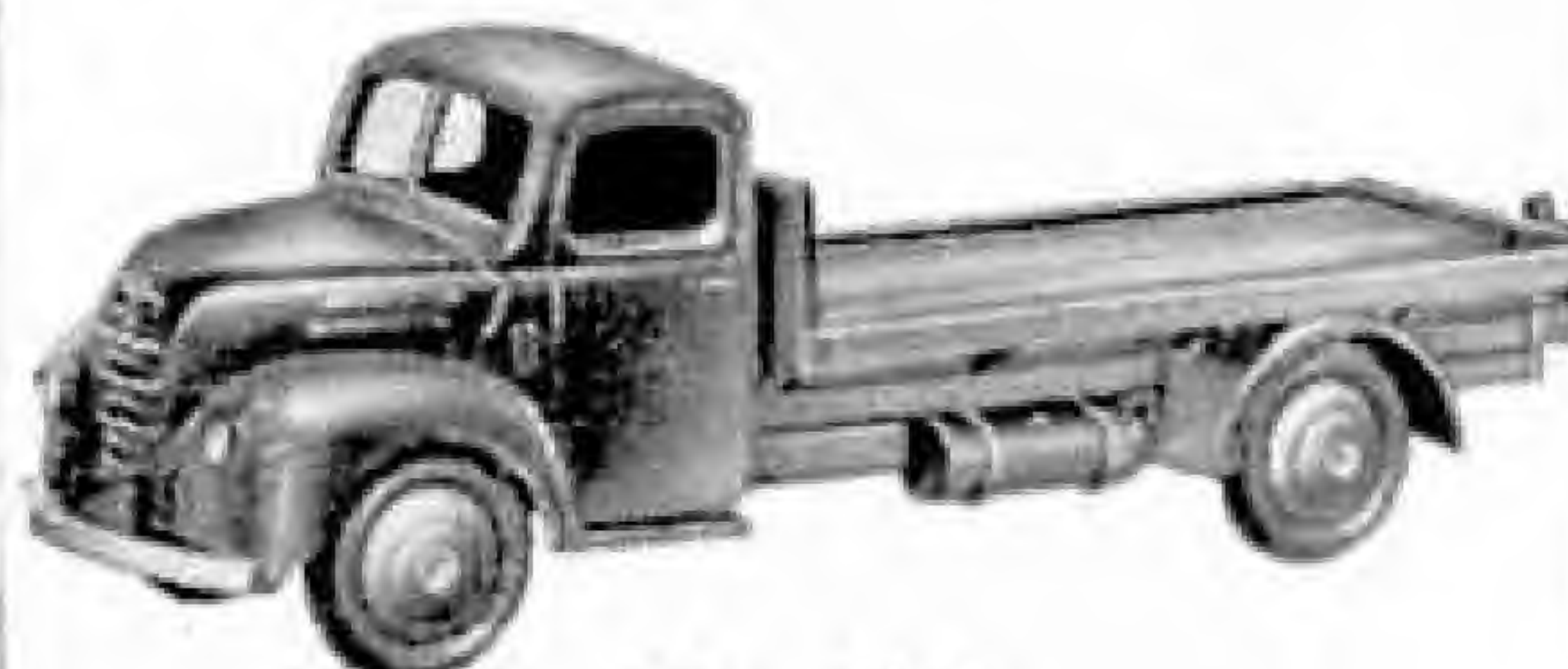
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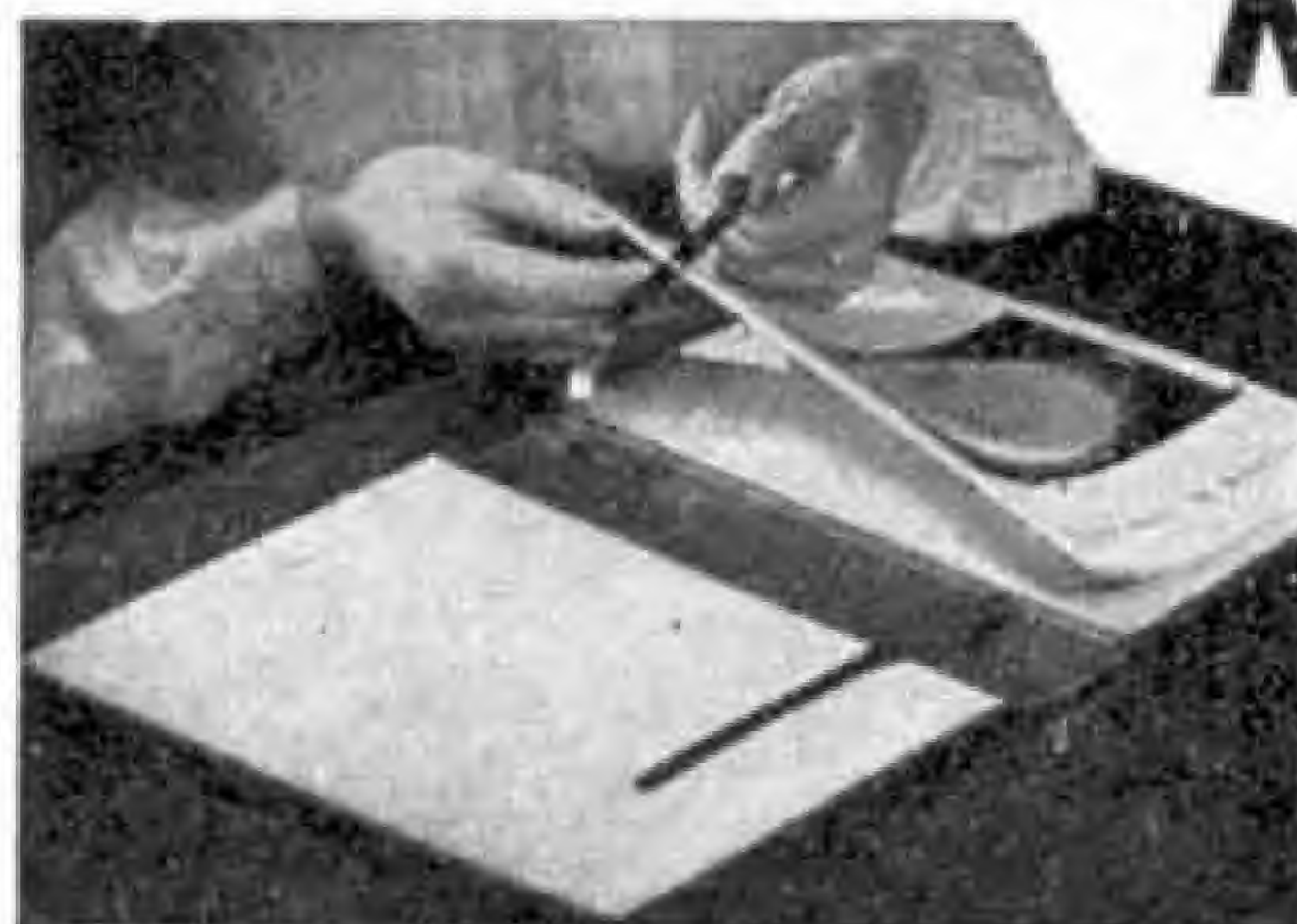
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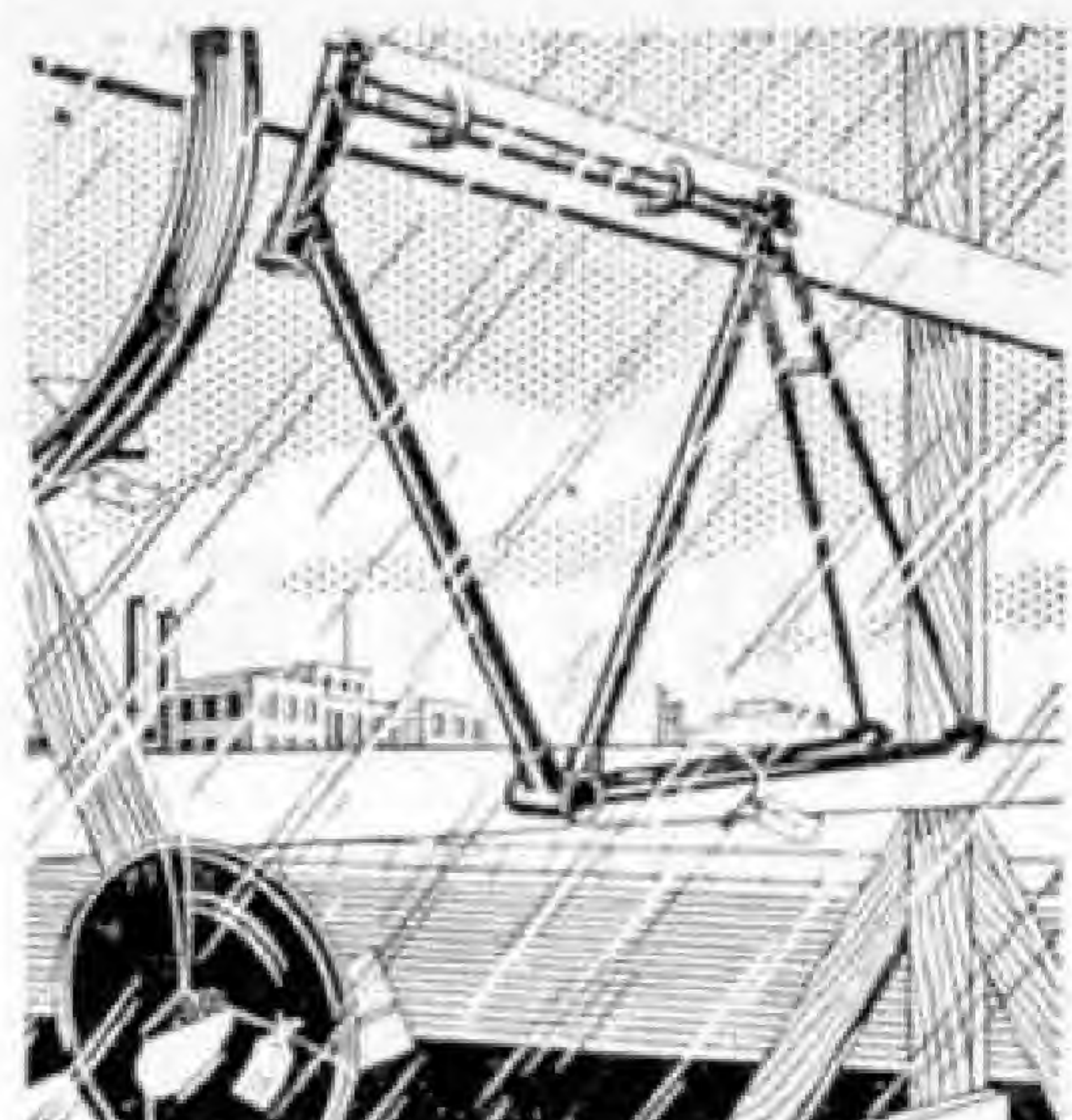
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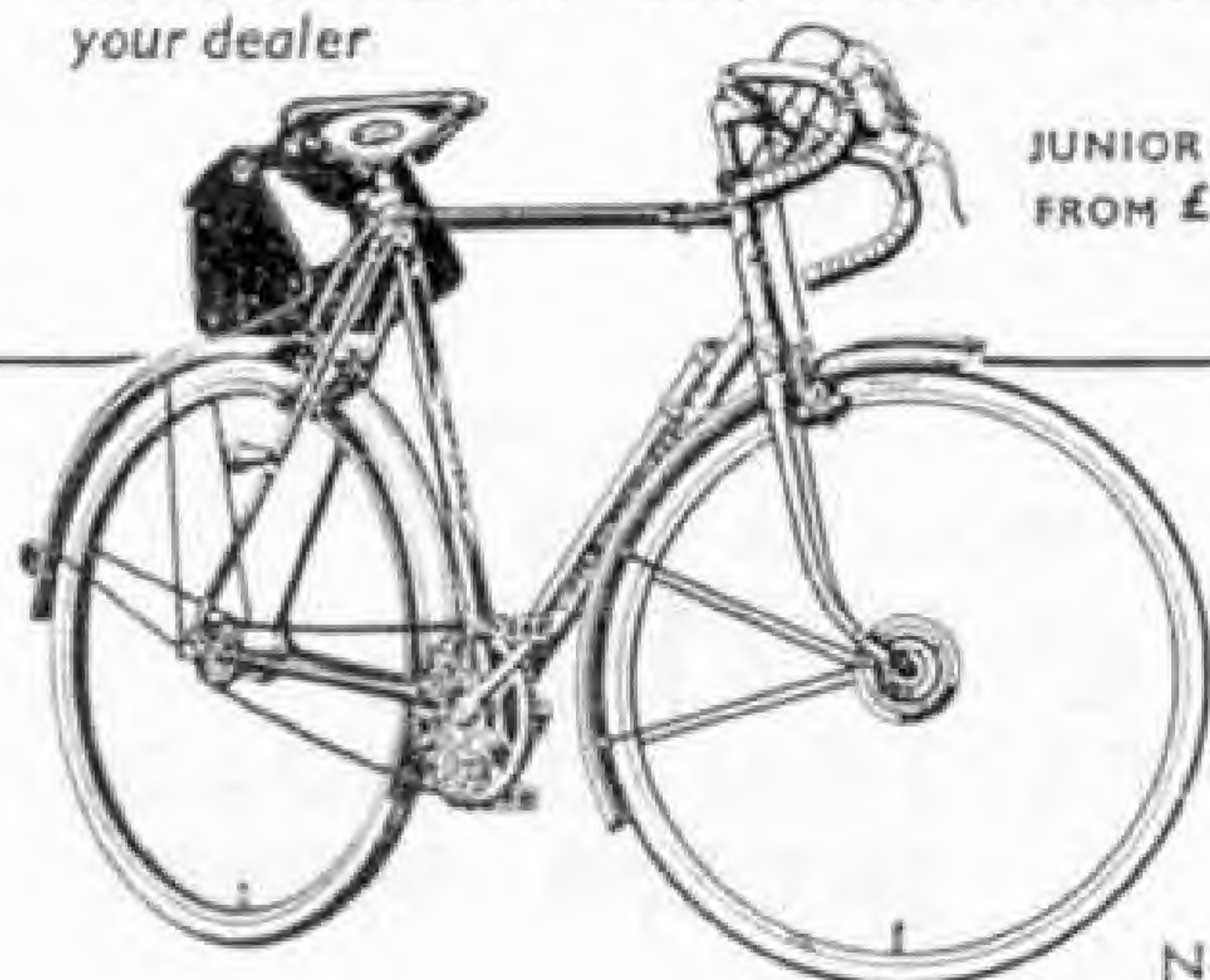


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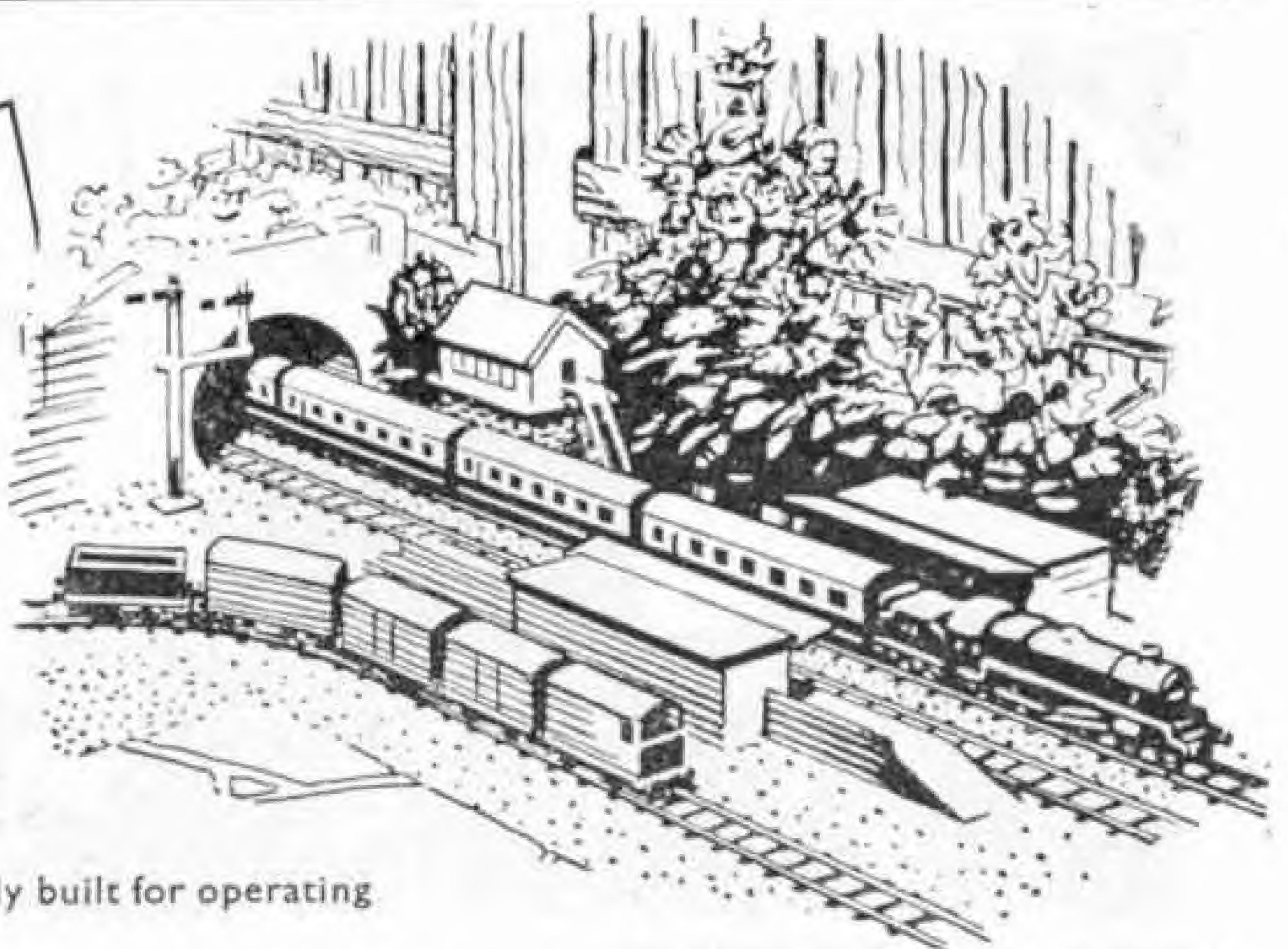
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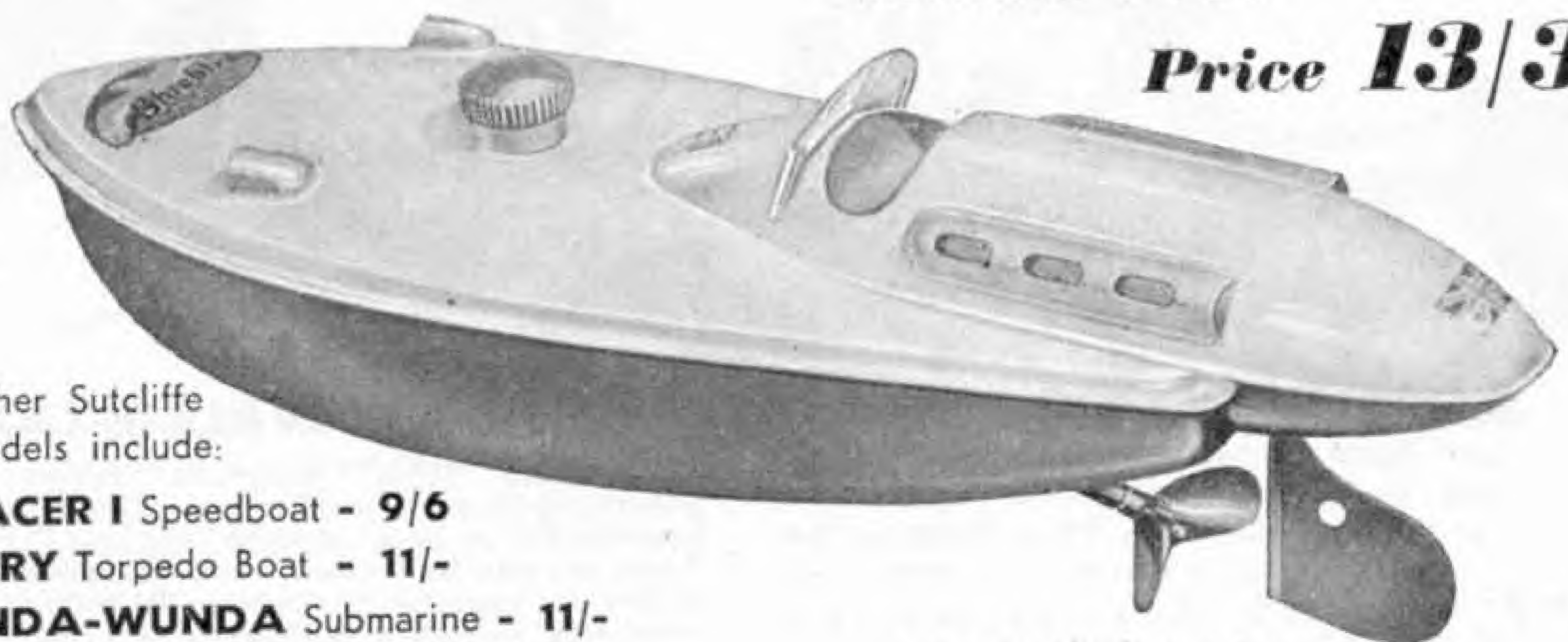
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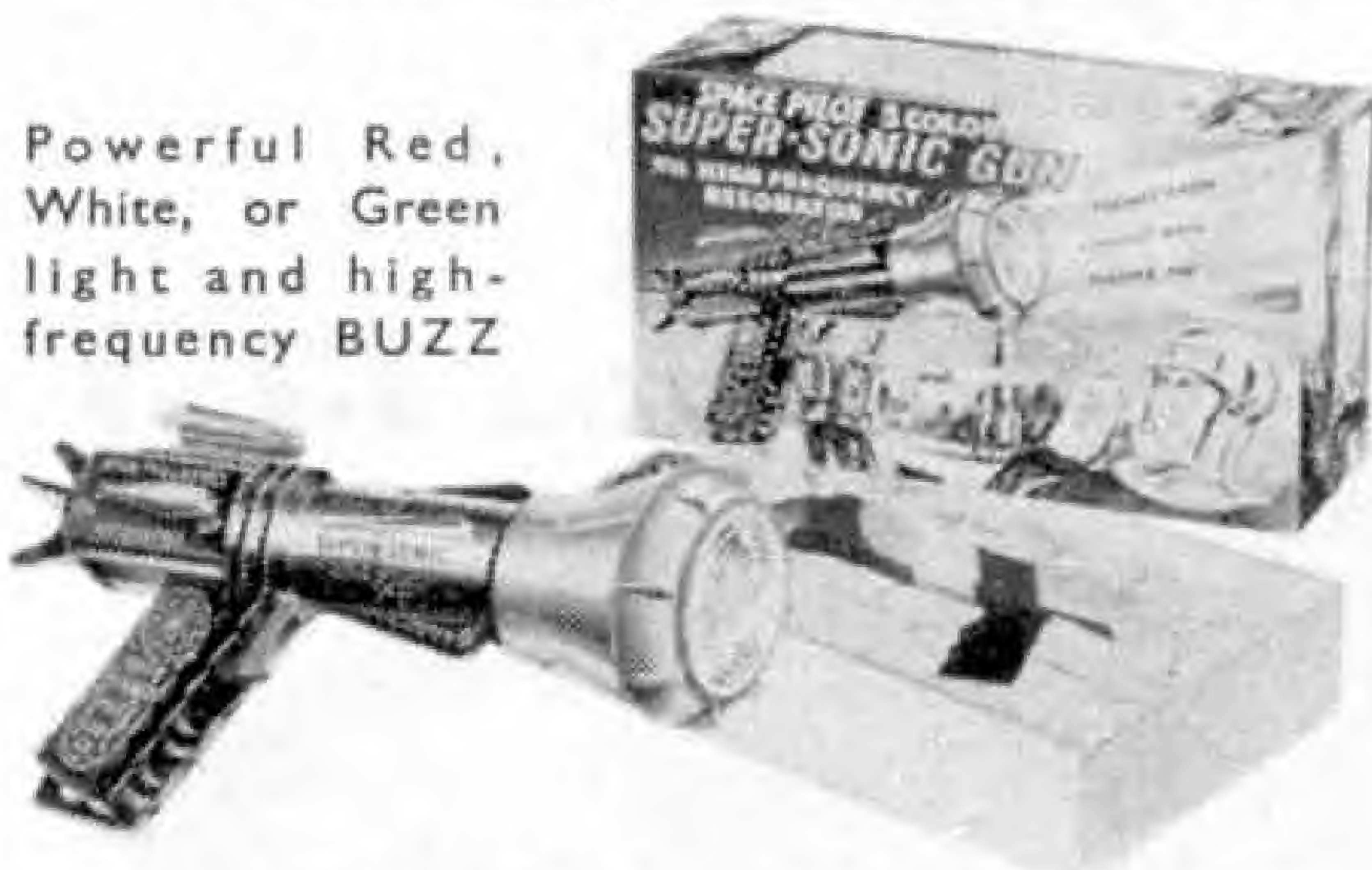


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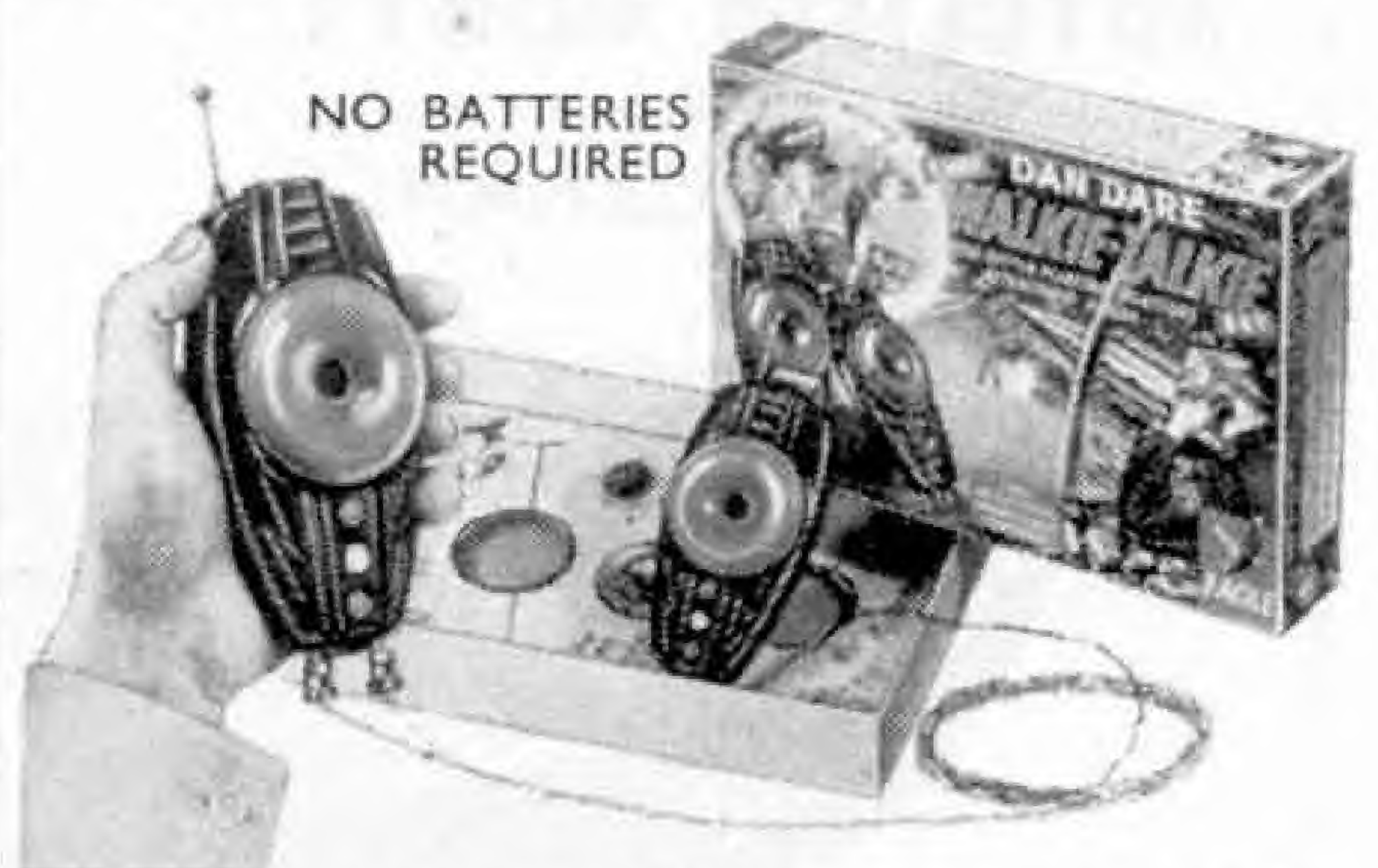
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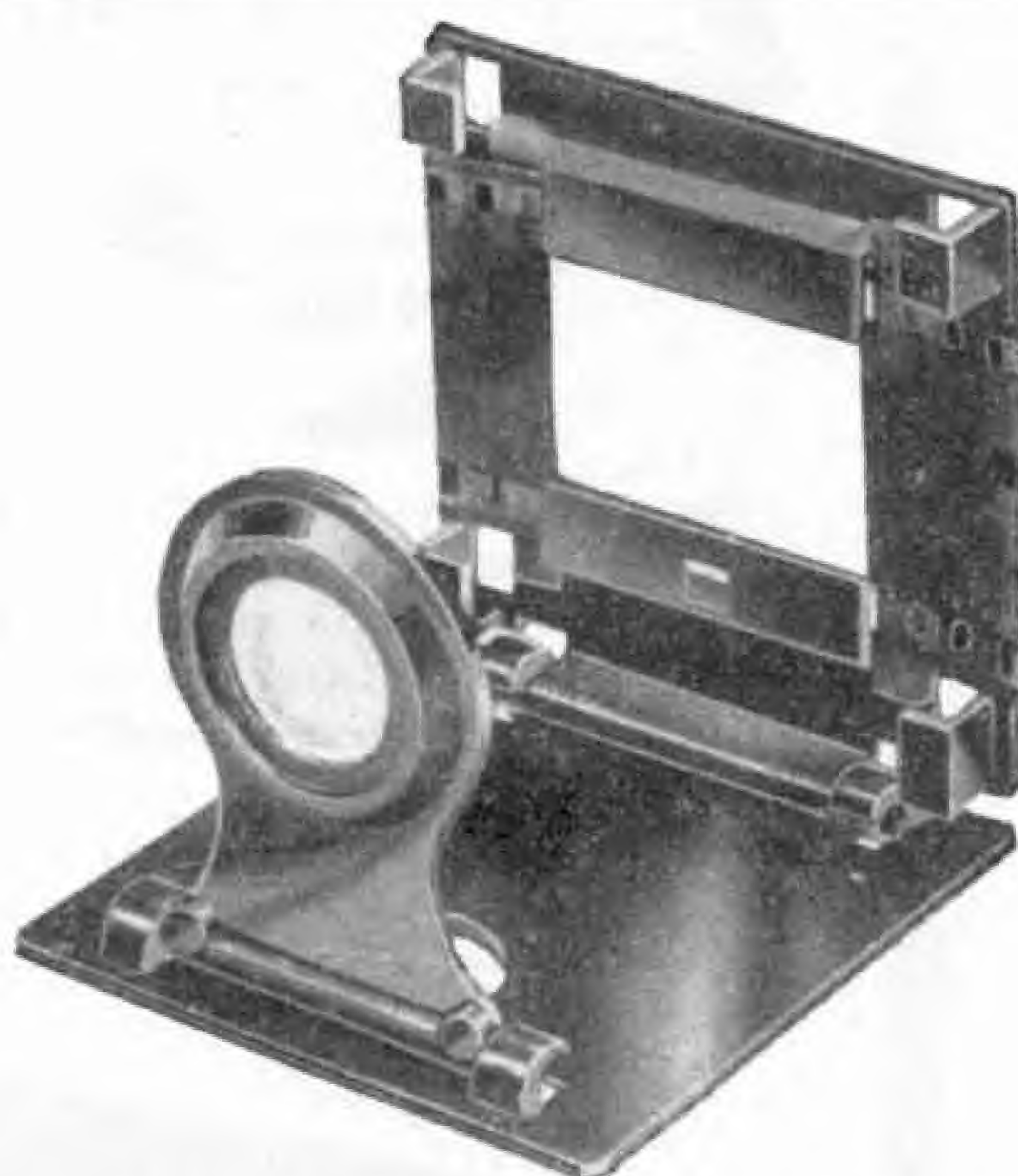
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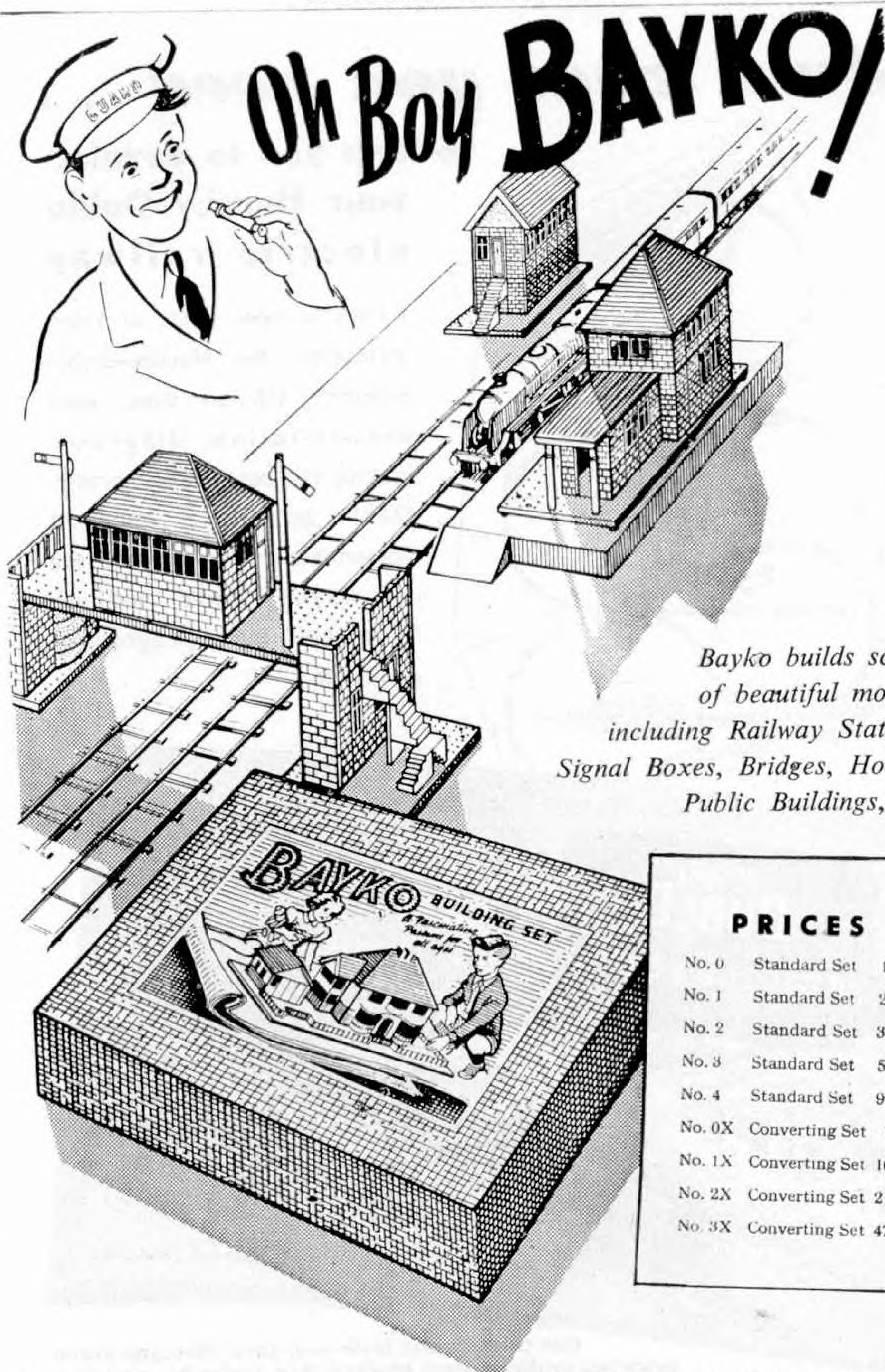
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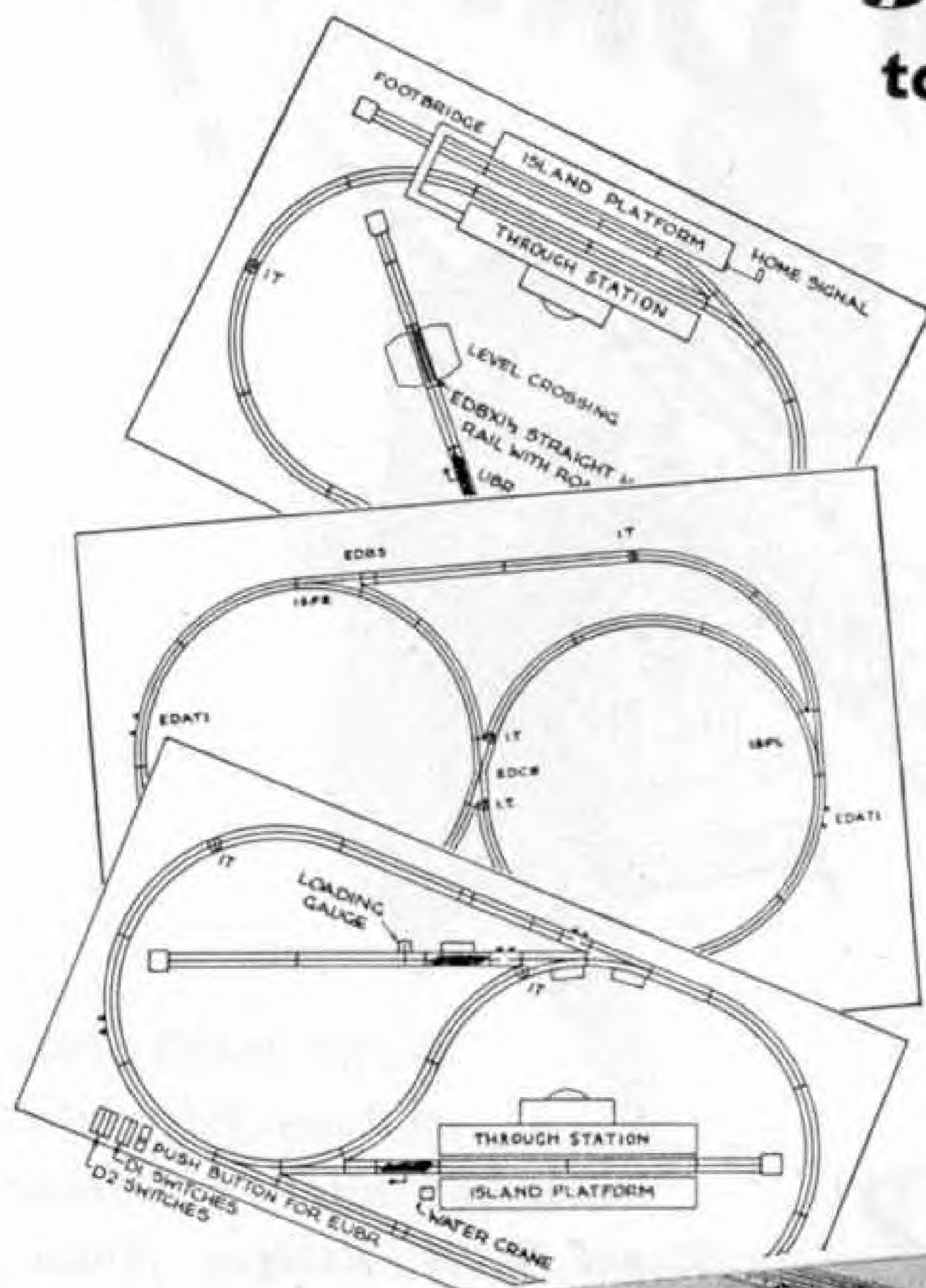
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MECCANO

MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

EDITOR : FRANK RILEY, B.Sc.

Vol. XL
No. 5
May 1955

The Highway Code

I have just been reading the new Highway Code. It has taken me a long time, because there is quite a lot of it—71 rules in Parts 1, 2 and 3, 13 pages of

and traffic signs that we meet with today. When passing through large towns, especially those in which one way streets abound, I have often thought that the poor driver should have a second pilot to make sure that all the signs and signals are seen and read correctly in good time.

I hope the booklet will be effective, but I have no profound faith in rules and regulations, as there always seem to be minorities who think they exist to be broken. Road safety is a matter for our consciences, and not until *all* who use the roads make up their minds to show every consideration for others will the number of accidents decrease appreciably.

Atomic Power Stations

I have pointed out that there is more in atomic energy than the making of bombs, and it is good to learn that the search for ways and means of using it in this way are being vigorously pursued. Electric power stations based on atomic energy are now planned or under construction in Great Britain and in the United States, and in the latter country a submarine has actually been built that makes use of atomic energy in much the same way as it is proposed to apply it to the production of electric power. An article on this peaceful and profitable use of atomic energy, the power of the future, will be included in next month's *M.M.* It will give news of one British experimental station, at Dounreay, in Scotland, that will actually create more "fuel" than it uses, an exciting prospect.

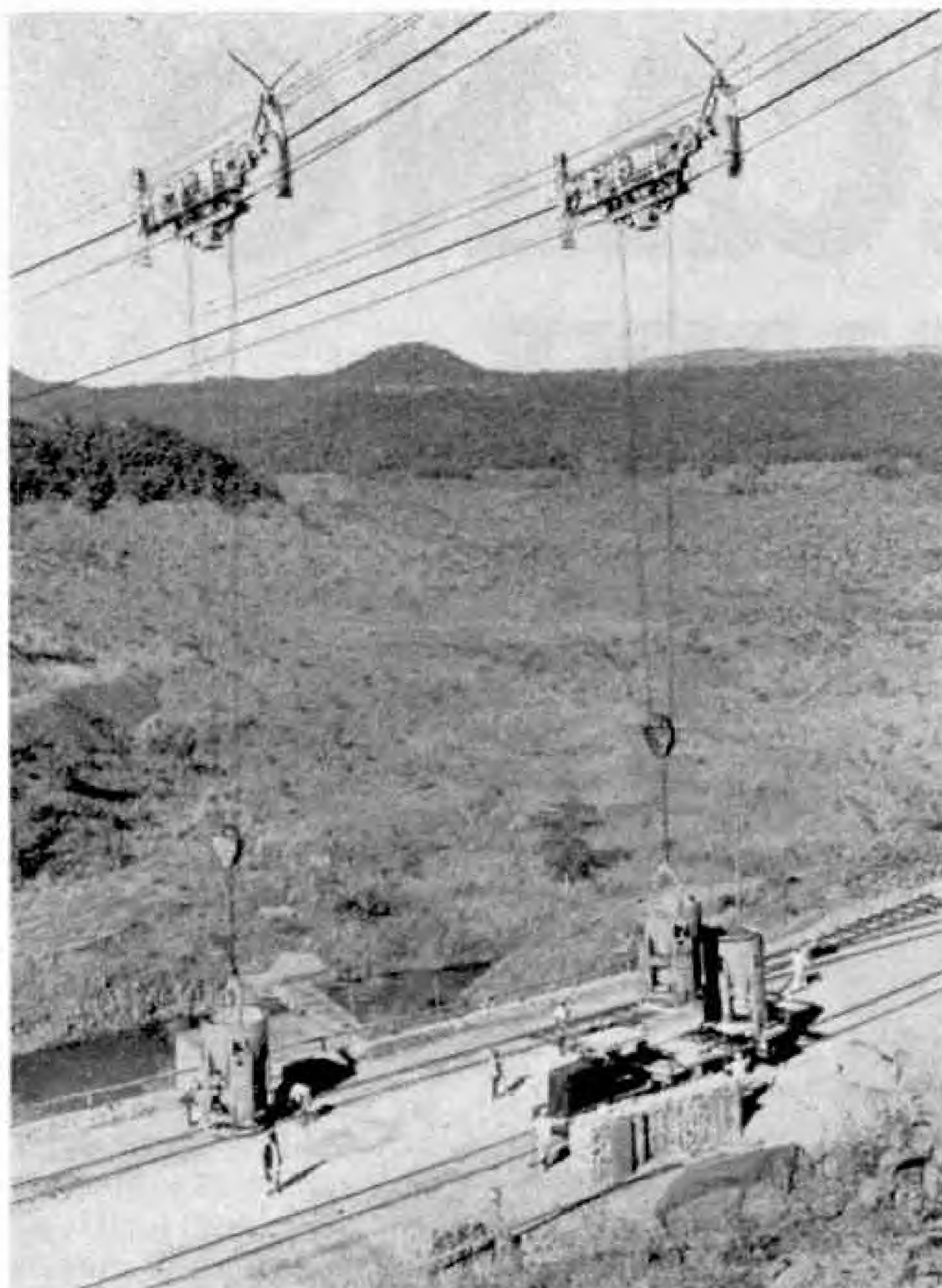
The Editor



Vandalism in the woods. A fine old tree scored by the penknives of the thoughtless. Now turn to page 258.

signals and traffic signs, and about 60 things that those who walk, cycle and drive motor cars must or must not do.

It is one thing to master the contents of the booklet, and another to make sure that we can act instantly in response to any or all of the multitude of signals



Building the Vaitarna Dam, India, with the aid of two Henderson cableways. The illustrations to this article are reproduced by courtesy of John M. Henderson and Co. Ltd., Aberdeen.

and viaducts. Sometimes there is some confusion between the names cableway and ropeway. Strictly speaking, a ropeway just carries materials, while a cableway hoists and lowers loads and carries them as well. A ropeway in fact is a conveyor, but a cableway is a cable crane with a very long reach. The cableway seen on our cover was capable of lowering its load 270 ft., and of hoisting and lowering loads at a speed of 250 feet a minute.

It is recorded that the first cableway to be used in Britain was designed by John Fyfe, of Kemnay Granite Quarries, Aberdeenshire, in 1873, and improved by John M. Henderson & Co. Ltd., to whom we are indebted for the illustrations on these pages as well as for the photograph on which our cover is based. It was not until about 20 years later, by which time they had been greatly improved, that cableways were used in other quarries and applied to many different purposes in Britain and overseas. They soon

acquired the highly descriptive name of Blondins, a name that came readily to mind when watching the load carriage run along the cable, apparently balancing itself as surely and as easily as did the famous tight-rope walker.

Cableways are not normally used for spans much below 200 or 250 ft. The longest Henderson aerial cableways—five in

number—used for the construction of the Nag Hammadi barrage in Egypt, had a span of 3,100 ft.

Blondins of Industry

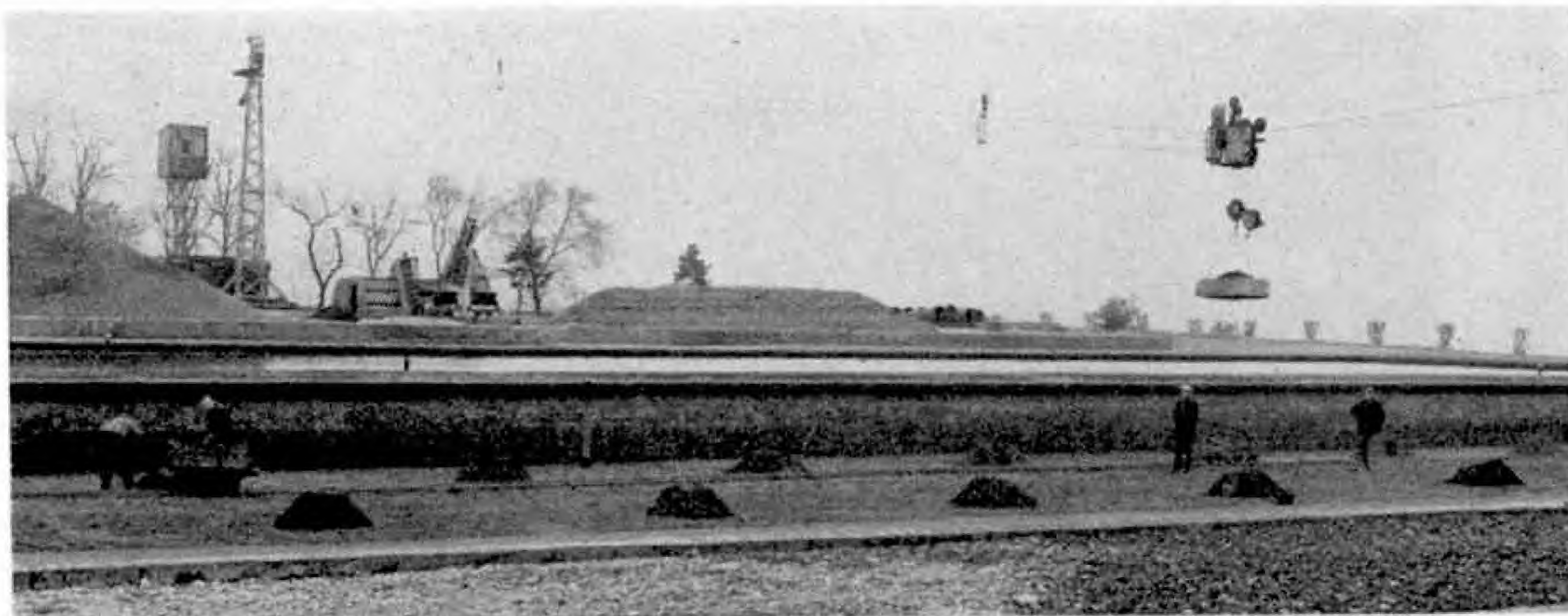
By the Editor

OF all the ways of carrying material to sites on which structures of some kind are being built, the aerial cableway is perhaps the most exciting. Our cover this month suggests this at once. It shows the building of the Claerwen Dam, one of the structures in the Elan Valley behind which water for the city of Birmingham is stored. During construction the site of the curving dam, which is shown nearly complete in the illustration, was spanned by two giant cableways, each 1,370 ft. in length, and on these, swinging through the air at a speed of 1,000 feet a minute, were travelling carriages, from which material required was suspended, ready for delivery to the spot where it was to be used.

In a sense a cableway can be looked upon as a development of the overhead crane, with a cable instead of a rigid girder to support the load. This of course allows for the use of very large spans, and that is why aerial cableways are so valuable in the construction of dams and barrages, bridges

each, but the more usual spans range from 1,000 to 2,500 ft.

Headmasts are made of steel sections, lattice construction, with the sections riveted together or connected by means of bolts. At the top is a saddle for the main cable, and there are also attachments for anchorage cables and other fittings. Besides the main cable there are other ropes for pulling the load carriage along and for lowering the load itself, all of which of course must be operated from the



central control of the entire cableway. An interesting feature of the modern cableway is that the main cable can be turned round to ensure equal wear over its whole circumference.

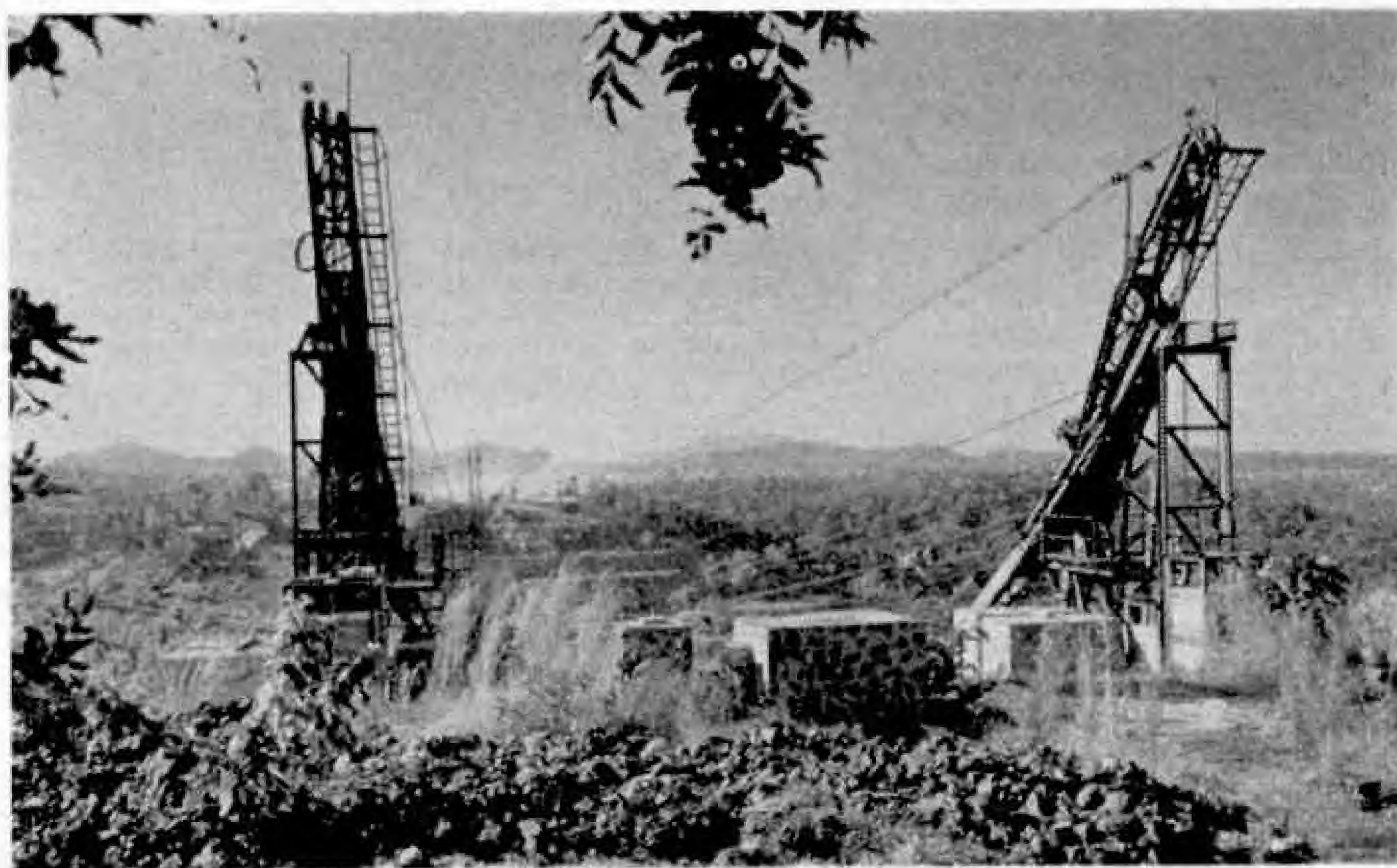
At the opposite end of the cableway is a tailmast, or tail carriage. These vary according to the type of cableway. They are made of steel sections, lattice construction, like the headmasts, and have provision for supporting or attaching the main cable and other fittings also. In certain instances the tailmast is fixed, and in some circumstances it can actually be dispensed with, a concrete block then acting as an anchor for the main cable. Usually, however, it is advantageous to arrange matters so that the loads carried by the cableway can be taken directly over the spot where they are wanted and then lowered into position. To attain this end the tailmasts are carried on radial tracks, so that they can be moved along to place the cable exactly where it is wanted for the particular part of its work in hand. To allow for the radial movement the top frame of the headmast of such a cableway is made to hinge, that is to swing

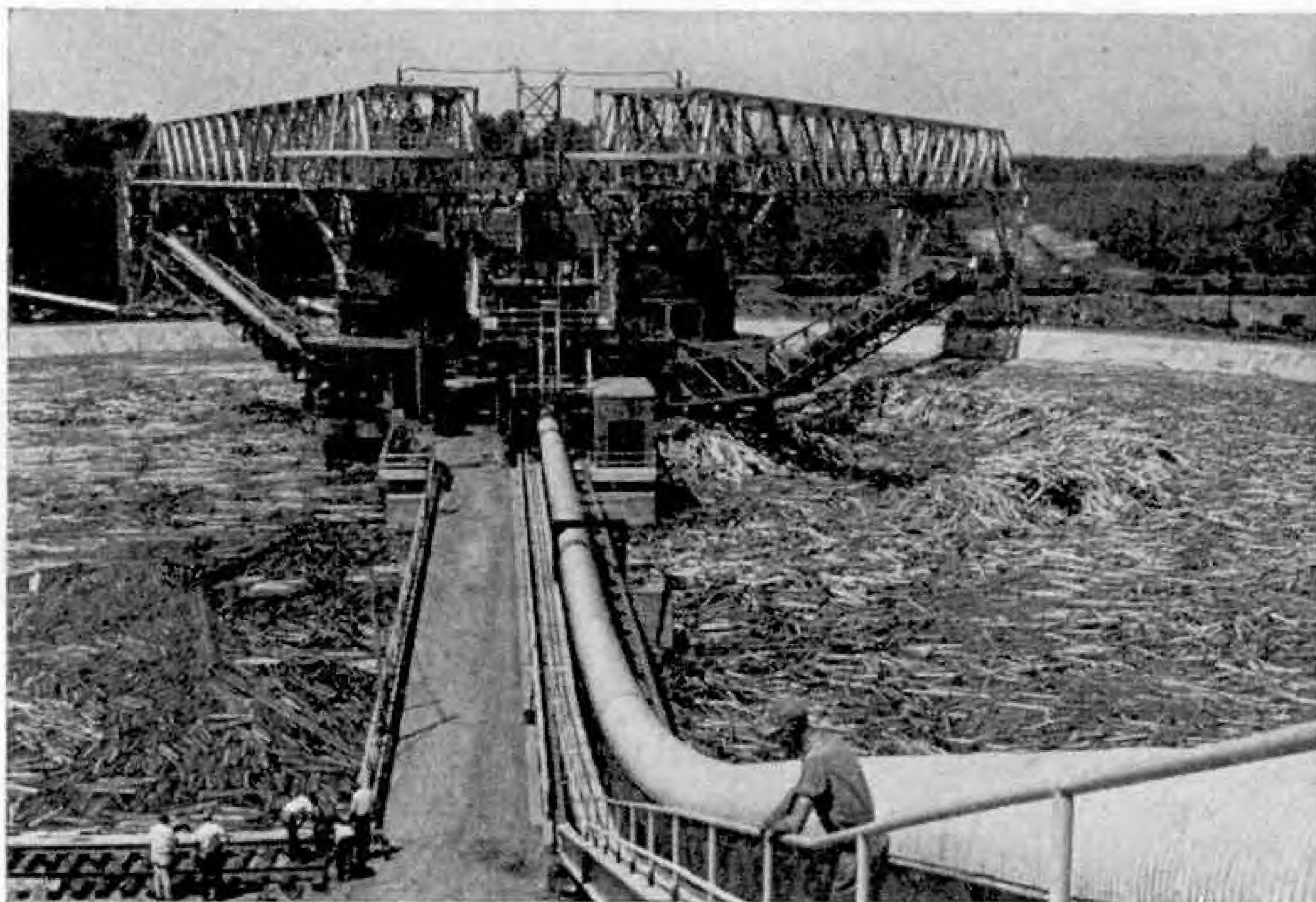
sideways, so that it is in line with the cable wherever the tailmast may be.

The load carriage may have six or eight wheels, the latter being the number of wheels on the latest type of Henderson load carriage. Below them are the pulleys over which run the ropes of the hoisting gear. The travelling rope, which moves the carriage along as desired, is attached to each end. The travelling rope is continuous, for of course it must act in both directions of travel of the load carriage.

The operator is usually placed in a cabin at a sufficient height above the ground to give him a view of the load at any point, but in addition a modern cableway is fitted with indicators that tell him immediately where the load carriage is on the cableway, and where the load itself is in its journey to the site where it is wanted. The latter is necessary, for the load must be landed gently, and exactly, not just dropped on the ground. Guidance (Continued on page 284)

The illustration above shows a Henderson 1-ton electric cableway in operation at Bolton Waterworks. On the right are seen the tailmasts of the Vaitarna Dam cableways.





New Paper Mill in Tennessee

By the Editor

AWAY in eastern Tennessee, in the Southern States, a great paper mill has been built and is being run by the Bowater Organisation, the well-known British paper-making firm. It uses wood grown in the surrounding area as its raw material, and derives much of its power from hydro-electric stations built along the course of the mighty Tennessee river, 650 miles long, and of the streams that feed it, by the Tennessee Valley Authority. The work of this Authority in developing this great region, half as large as Great Britain itself, has become a model for the whole world.

This great new paper mill is not the first that has been established overseas by the Bowater Organisation. To-day Bowater mills number ten, among them five that are ranked with the world's major newsprint mills. Its first was built on the banks of the Thames near London. This was followed by another at Ellesmere Port, near Liverpool, and two others in Kent, to which later were added mills abroad, near the areas from which came the wood that forms the raw material for newsprint and board.

The great log pond at the Calhoun Mill, Tennessee, is large enough to float a 10,000 ton ship. The illustrations to this article are reproduced by courtesy of The Bowater Paper Corporation Ltd.

One of these mills is at Corner Brook, on the west coast of the Canadian Province of Newfoundland, where the output has now been raised to 300,000 tons of paper a year. The 37 grinding machines at Corner Brook turn out more than 725 tons of wood pulp a day.

After the war there was a famine in newsprint that emphasised the immense call for paper that exists in the world to-day. We are in fact in a paper age. This is not surprising when we remember the growth of population in such great countries as the United States, where the

n u m b e r o f inhabitants increased by 20,000,000 in the ten years ending in 1950. The circulations of newspapers indeed increased everywhere after the war, and in

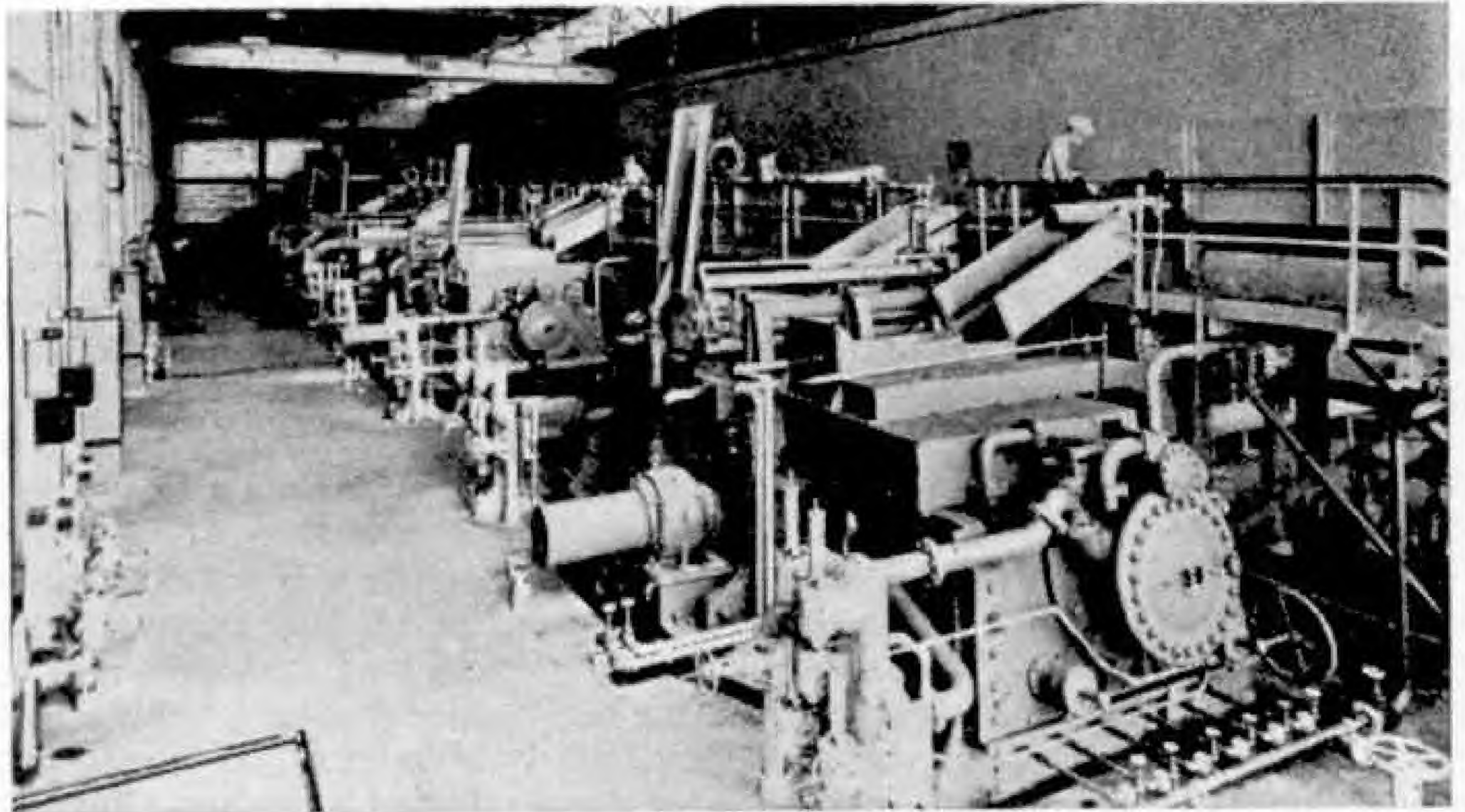
the States alone newsprint consumption increased by almost 60 per cent. It was this that decided Bowaters to build yet another mill, and to do this in the United States, where there was the heaviest demand.

The choice of the Southern States for this enterprise was a bold step. The woods that had been used for making newsprint

Logs are rapidly reduced to pulp by forcing them against grindstones under a cooling stream of water.

were characteristic of northern climates, but the South too has natural resources of value to the paper maker, the most important of which is the southern pine. This tree has the advantage that it is ready for pulping when it is 20 to 25 years old, whereas the spruce and fir of northern latitudes require 70 to 80 years to reach this stage. On the other hand, southern pine is resinous. This had long been thought a drawback, but patient work by chemists solved the problem of pulping and bleaching, ready for transforming into paper, after several years of research.

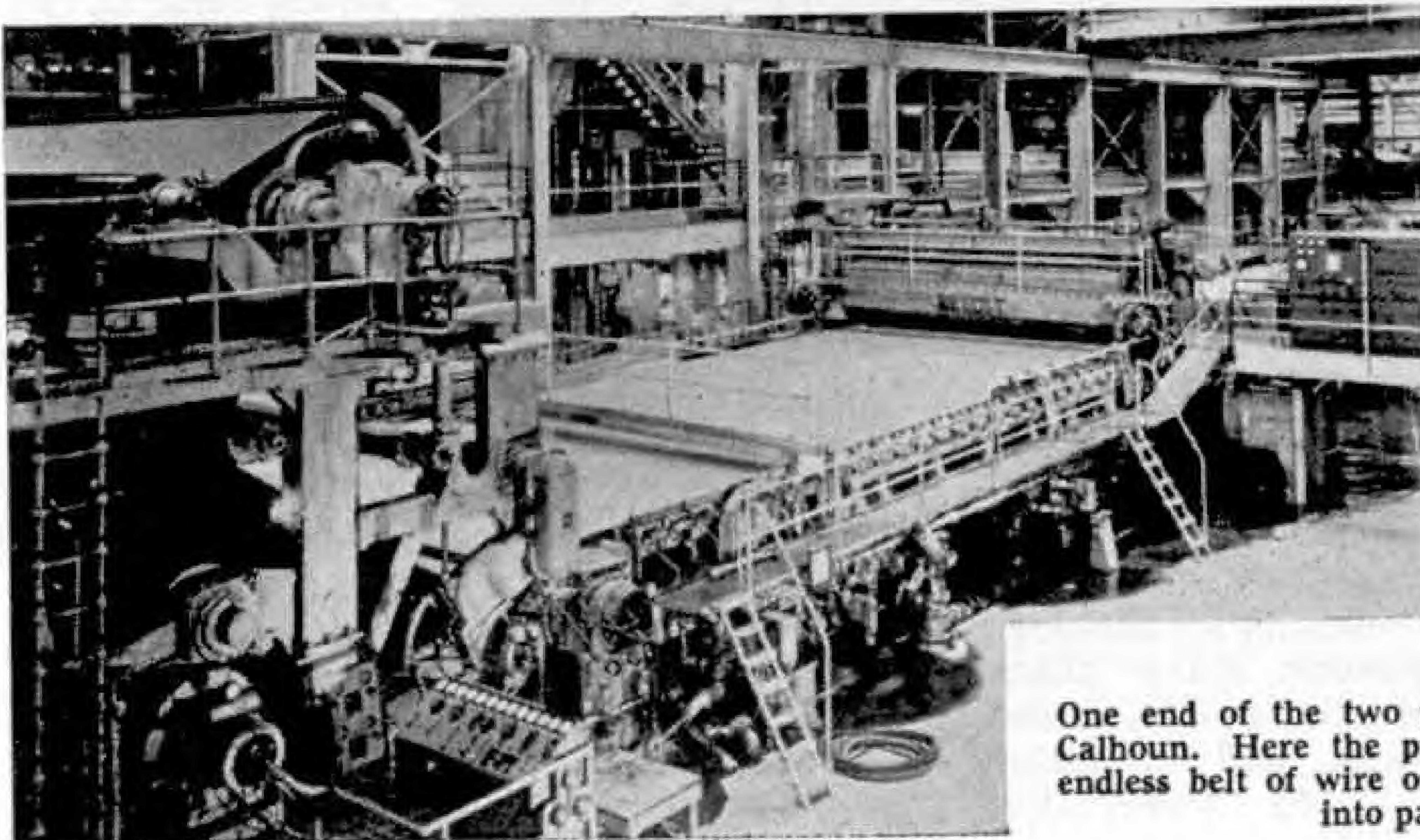
So after a careful survey a site for the new works was chosen at Calhoun, on the banks of the Hiwassee River, about 15 miles from where it flows into the Tennessee. The area in which the new mill was built has of course the advantage that ample supplies of hydro-electric power are readily available, and in addition its population is increasing rapidly and its industry is expanding. The mill covers an area of 1,800 acres, and its products can readily be distributed by water as well as by road and rail to the major towns and cities throughout the Southern States.



Paper making is a continuous process. At Calhoun raw material goes in at one end of a low modern building nearly a quarter of a mile in length, and the finished products, wrapped rolls of newsprint, and bales of pulp, come out at the other end on to the platform from which they are shipped to their destinations. The mills are thoroughly modern in every respect. Indeed they have been described as nearer to a completely push-button plant than any other paper mills in the world. Let us look at some of the remarkable features they possess.

Perhaps the most striking of these is the log pond in which the wood that reaches the mill is stored. Southern pine deteriorates rapidly when stored in the open, so it has to be kept under water until the time comes for it to enter the mill for conversion into pulp and paper. Look at the illustration on the previous page, which shows the storage pond, 500 ft.

across, in which the logs are submerged after they have been stripped of their bark. It is large enough to float a 10,000 ton ship, and in it can be placed 3,000,000 cu. ft. of pulp wood, which would keep the mill running for six weeks, day and night.



One end of the two paper-making machines at Calhoun. Here the pulp flows on to a moving endless belt of wire on which its transformation into paper begins.

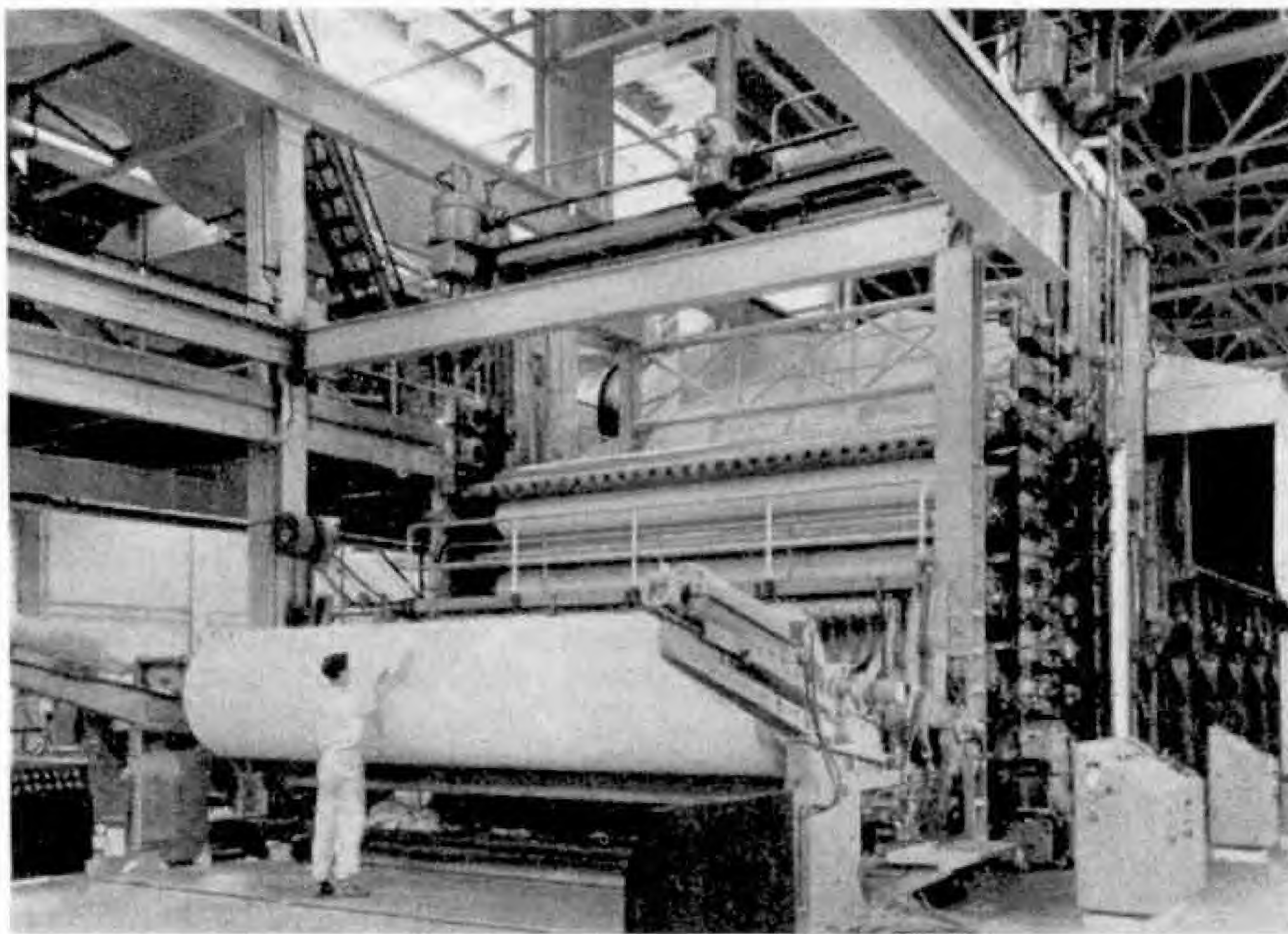
This log pond is a pioneer achievement that in itself would make the huge new mill remarkable. Its scale, and that of the huge pivoted gantry cranes working over it, can be gauged from the figures of the men in the lower foreground. As the cranes rotate, their grappling gear picks up the logs and feeds them to conveyors that carry them into the mill.

From the storage pond the logs are carried by conveyors to the wood preparation house, where they are sorted out for chemical or mechanical pulping on a moving turntable. Those picked out for chemical pulping are reduced to chips by fast rotating knives in a gigantic machine. The chips stream through screens that make sure they are evenly graded, and are then carried mechanically along enclosed conveyor belts to storage silos and later to the digesters, where they are cooked in a chemical solution under steam pressure. There are five of these huge digesters, and in them resins and other substances that hold

mixture looking something like porridge.

For making paper in the two great machines installed in the mill a mixture of mechanical or ground wood pulp and chemical pulp is used, about four parts of the former to one part of the latter. The length of a paper machine is astonishing to all who have never seen one before. The lower illustration on the previous page shows the beginning of one of those at Calhoun. The pulp mixture, 99.5 per cent. of which is water, flows in a steady stream on to a moving endless belt of wire mesh. The water is mostly removed by drainage, suction and pressure as the mixture passes along the machine, leaving a fast flowing web of moist fibres, closely interwoven and felted together. The product now begins to bear some resemblance to paper, and all surplus moisture is removed from it by passing the web through 66 large steam-heated cylinders, from which it emerges as a dry, white and thin strip of paper. This is smoothed by passage through heavy

calender rolls, and it leaves what is called the dry end of the machine at the rate of 2,000 ft. a minute. Its progress is never checked, the rolls



Smoothed by heavy calendering rolls, the strip of paper emerges from the "dry" end of the machine at the rate of 2,000 feet a minute.

the wood fibres together are dissolved. The pulp that results is then washed clean and bleached.

Logs for mechanical pulp are carried by a high-speed stream of water along a flume, or narrow channel nearly 2,000 ft. in length, that takes them to the grinder room. There they are fed by hand into eight grinders, each powered by a 4,500 h.p. motor. Hydraulic pistons force them against rapidly rotating grindstones, under a stream of cooling water, and the latter carries the resulting pulp away, the

of paper being swung clear of the machine as fast as they are completed.

The rolls from the paper-making machine are 232 in.

in width. They are too wide for the machines on which newspapers are printed, so they are rapidly unwound and passed beneath circular knives, which cut them to the widths required. They are then rewound, automatically, and even wrapping and marking with trade marks are carried out automatically by ingenious machines.

Some of the chemical pulp produced in the Tennessee Mill is shipped to other mills of the Organisation in Great Britain, for conversion into a variety of printing and packaging papers.

Steam Rollers

By H. A. T. Aitken

NEXT to the modern car, with its high speed and smooth lines, the old-fashioned clumsy steam roller is probably the most fascinating vehicle on our roads today. How many of us have watched the grinding motion of the rollers, the hiss of steam, and the thump, thump, of the flywheel. Some of these steam rollers are old timers now, one of them at least 78 years old and still working. Many of the drivers, too, stay with their rollers for years and get to know all their peculiarities.

The world's first steam roller was built in 1867 by Thomas Aveling, who began as an apprentice to a farmer at Canterbury. Becoming fascinated by the possible application of steam power to drive farm machinery, he set himself up as an

and the steering roll was 5 feet in diameter and 5 feet wide. Despite its size the machine

could turn in its own length. The first roller was sold to the City of Liverpool. Another of the same type was still working in 1926.

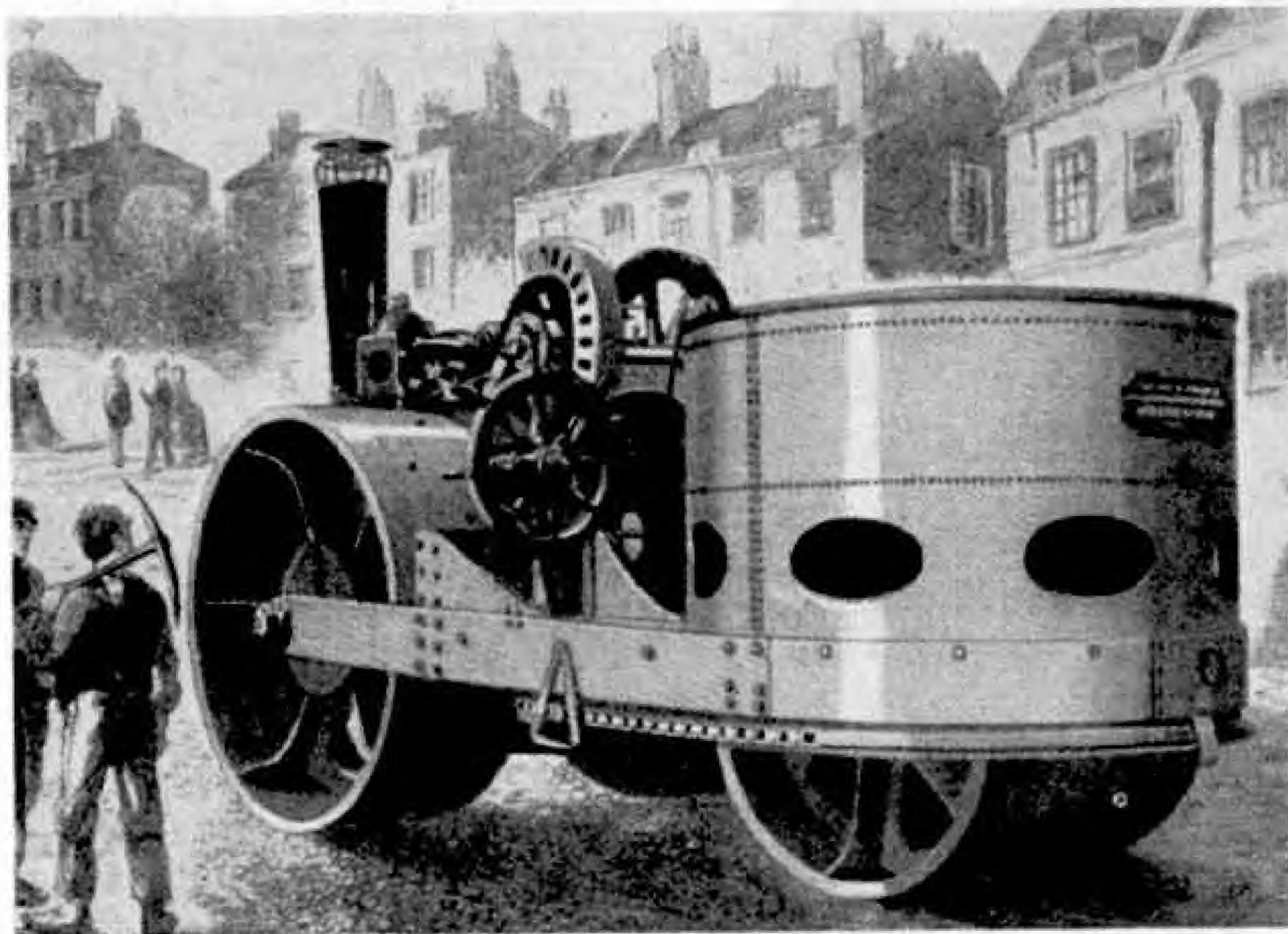
Later, Aveling introduced a roller with a front roll, chain operated steering gear. The front rolls, which covered the space left by the rear rolls, were conical in shape. Thus, on the ground, they were close



together, but at the top there was a gap between them, so that a vertical shaft could be attached to the centre of the "dead" axle. Then he improved the design by introducing parallel front rollers, with a steering fork spanning them, thus providing a mounting for the axle and steering chains. This became the accepted pattern and is in use today. William Barford should be mentioned too, in connection with the development of the road roller. He increased the weight of the cylindrical front rollers by filling them with water, and this method is still in operation.

The modern steam roller varies in weight

from 6-12 tons, with a speed of nearly 3 m.p.h. It uses about 400 lb. of coal a day, which is the capacity of the bunker. The fire is lit daily, and it takes 1-1½ hours to raise steam. The average water tank holds about 85 gallons, and as the roller uses 300 gallons a day, it has to be filled up about three times. If the machine is to work any distance from a hydrant a water tank is towed along behind. Clean water is a vital need, as indeed it is for any steam engine, and a driver wouldn't dream of just filling up from the nearest village pond.



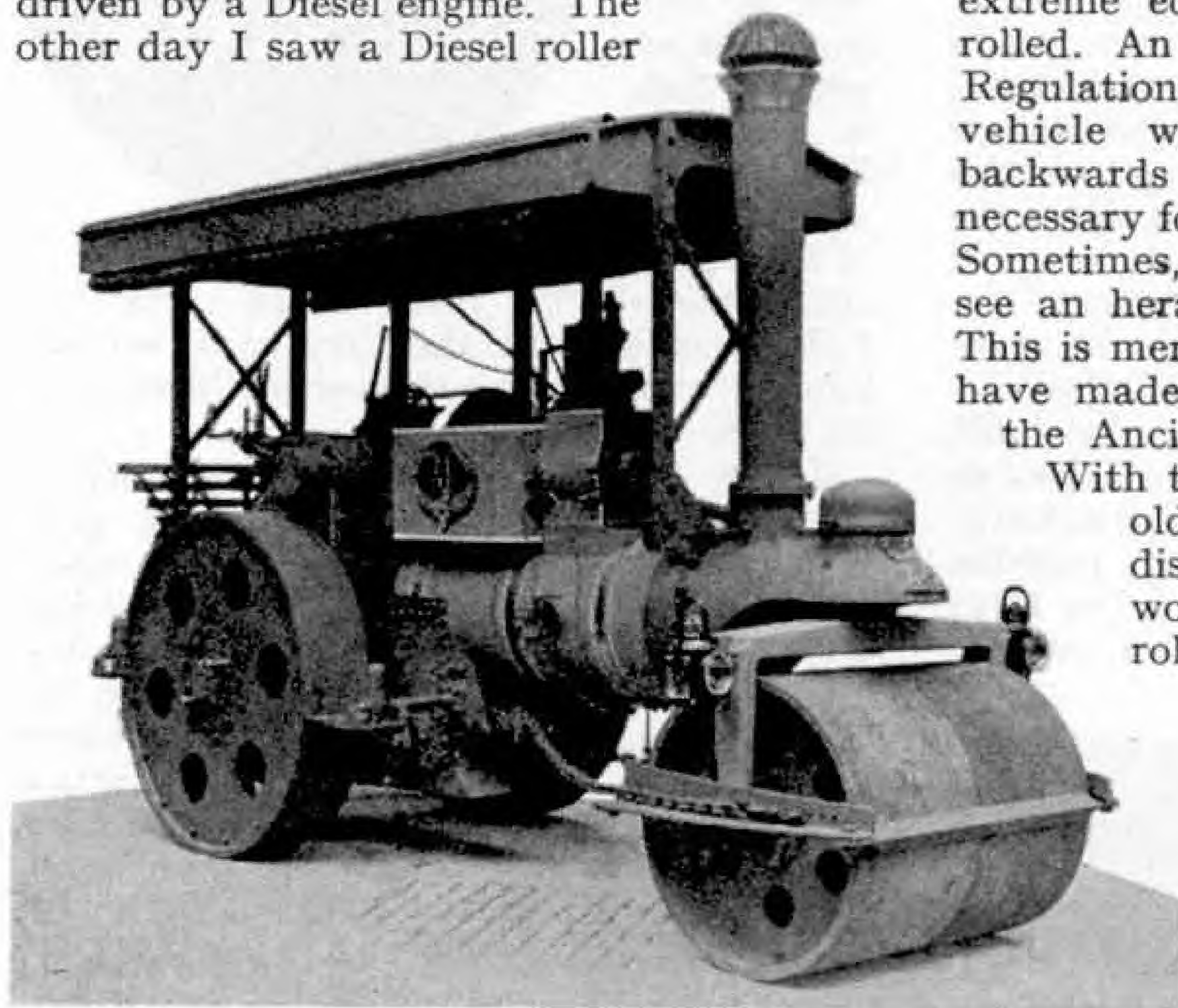
The first proper road roller, built by Thomas Aveling and used in Liverpool. It weighed 30 tons and could turn in its own length.

agricultural engineer. The success of a traction engine, with very wide driving wheels, towing a cast iron roller, made him decide to construct a road rolling machine, which first operated in Hyde Park.

Convinced by his successful experiments, Aveling started to build his first proper road roller. The machine weighed about 30 tons and had an engine of 12 h.p. The water tank held 500 gallons, and the steering was by a handwheel operating a chain to the steering roll. The driving rolls were 7 feet in diameter and 2 feet wide,

Sometimes steam rollers operate away from home, and on these occasions, the driver's living caravan is towed along behind the roller.

About 1904 a new era was started by the production of a road roller run by an internal combustion engine, and about twenty years later came the first roller driven by a Diesel engine. The other day I saw a Diesel roller



An old type steamer, showing the chain and worm steering gear. This illustration and the one below are reproduced by courtesy of Marshall Sons and Co.

with "L" plates, and the driver under instruction. Although a roller isn't licensed the driver has to pass a test by a Ministry of Transport Inspector. In one borough the test is carried out by the Inspector of Trolley Buses.

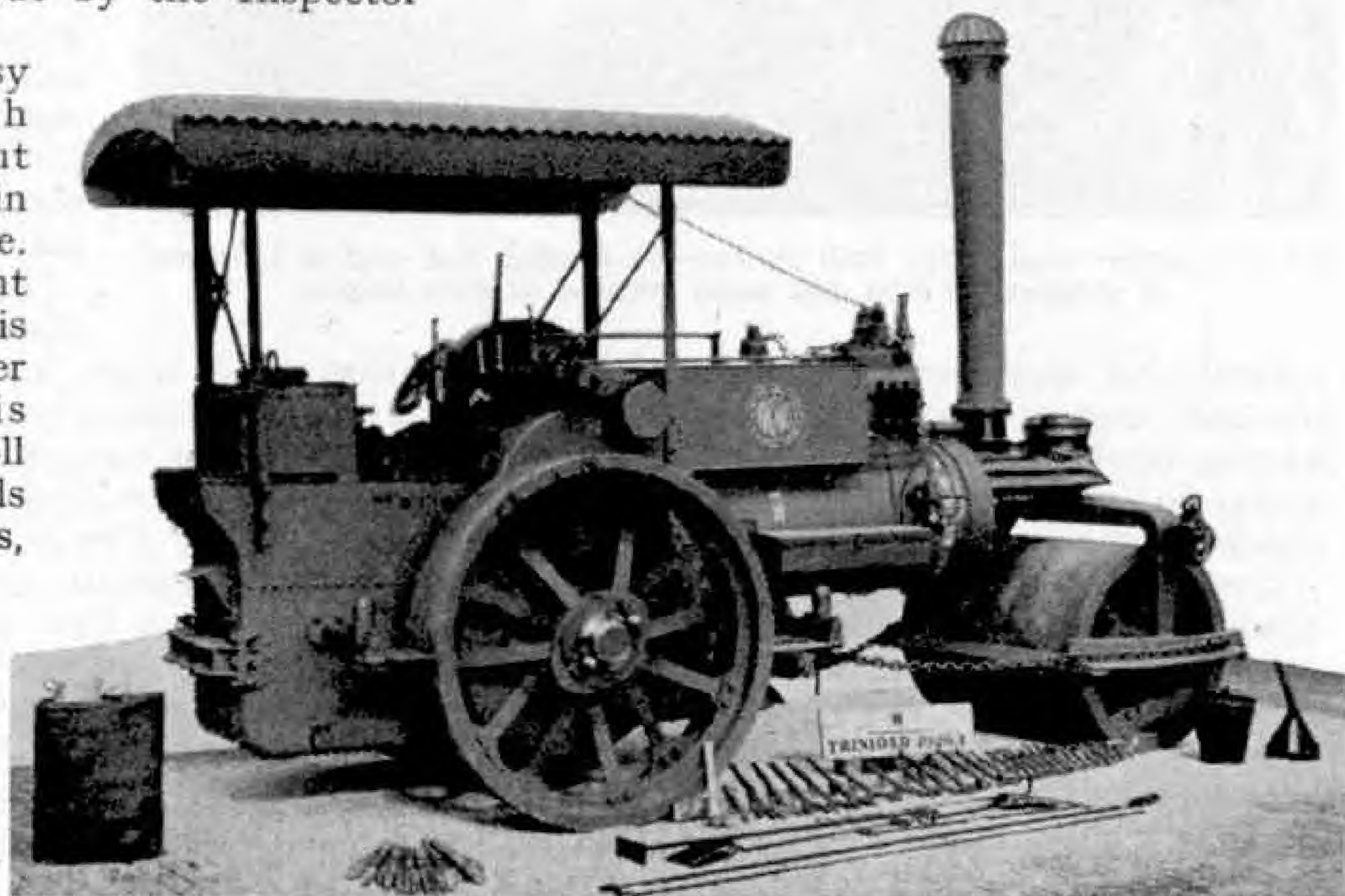
A Diesel roller is easy to handle, with hydraulic steering, but there are tricks, as in driving any machine. The most important factor in road rolling is to preserve the camber of the road. This means starting to roll from the kerb outwards towards the crown, as, otherwise, the

surface would become saucer-shaped. This assumes that the rear rolls are rigidly mounted on a fixed axle, as in most types of roller.

There is, however, a machine with what is called an automatic cambering rear axle. This allows the rollers to adjust themselves to the contour of the road, and enables extreme edges of work to be effectively rolled. An interesting feature of the Road Regulations is that a roller is the only vehicle which is "allowed to travel backwards for a greater distance than is necessary for the comfort of its occupants." Sometimes, in front of a roller, one can see an heraldic device—a rampant horse. This is merely a trade mark, and the firm have made use of the arms attributed to the Ancient Kingdom of Kent.

With the advent of Diesel rollers, the old steamers gradually fell into disuse, though they have long working lives. The oldest steam roller still working was built in 1876, and is owned by the Municipal Council of the Port of Spain, Jamaica; 79 years old and still going strong. In 1879 a roller was built by the same firm for Oslo Municipality, and this machine also is still in use. A 62-year old, now pensioned off, was in use by a firm in Kidderminster until 1951.

It was then reconditioned by an enthusiast from Oldbury, in his spare time, and presented, in 1953, in full working order, to the New Science and Industrial Museum,



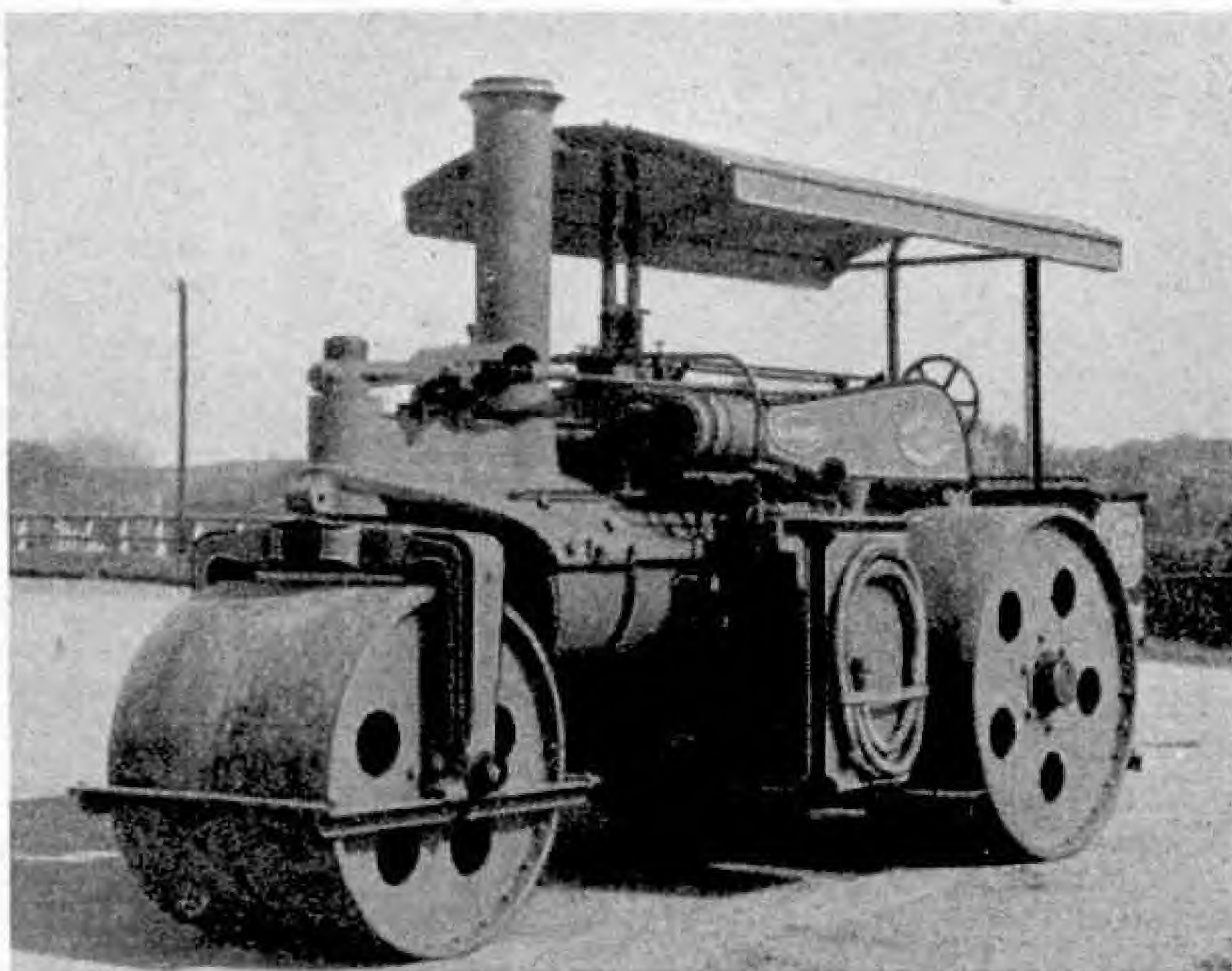
A very early Marshall steam roller, with an array of tools with which it was equipped. It has spoked rear wheels and small front rolls.

A modern steam roller built by Wallis and Stevens Ltd., Basingstoke. This has the patent automatic cambering rear axle mentioned in this article.

Birmingham. Such machines were made to last! A picture showing the veteran on its way to the Museum was reproduced in the August 1953 *M.M.*

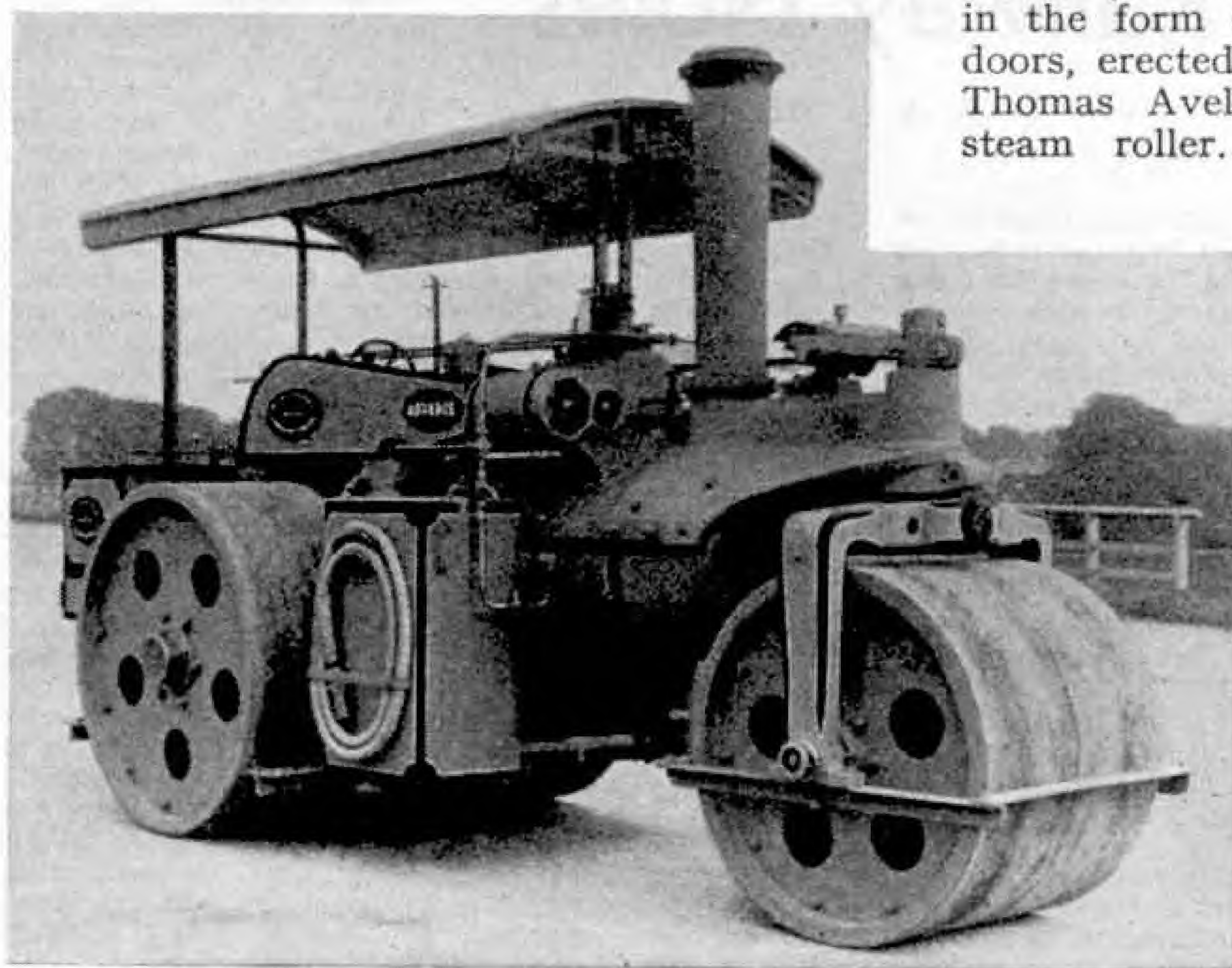
There are still a number of old steamers working up and down the United Kingdom, from South Wales to the Channel Isles, many of them half a century old. Four or five years ago there was a tandem type of roller working in St. Albans. This is a roller with large rolls at each end, and this particular one had an extra roll added at one end, making three in all. Such rollers usually have vertical, instead of horizontal, boilers, and are designed for higher speeds and instantaneous reverse. Reversing quickly a roller with a horizontal boiler would result in the water rushing from one end to the other, like a bath into which you've leapt too quickly.

Vertical-boiler rollers are used for rolling asphalt, where it is necessary to reverse quickly and not halt. Standing or dwelling on the hot, soft asphalt

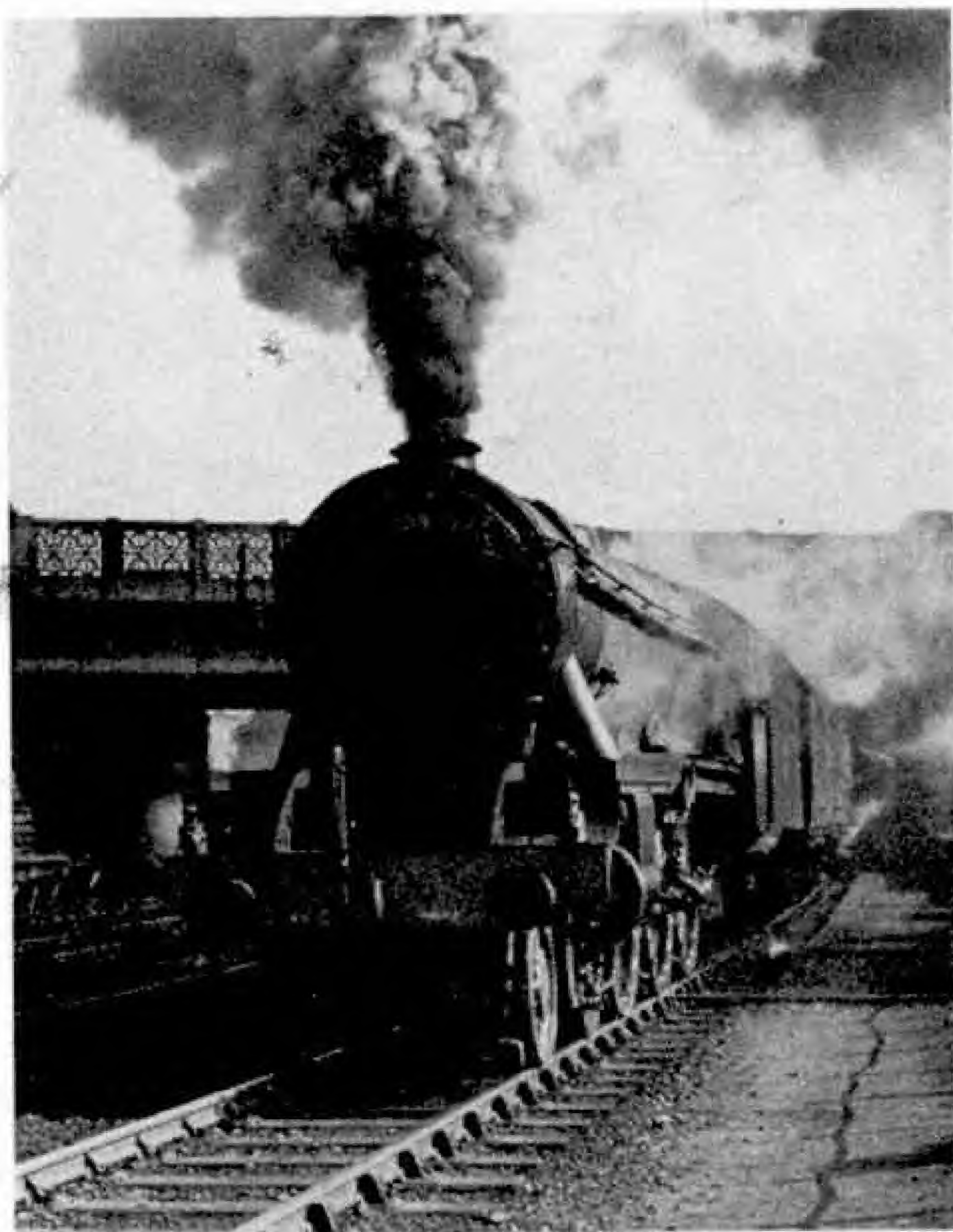


would be ruinous. In Flintshire there is a 6-7 ton machine, 3-roll, working today, which has an inclined boiler, that is one neither horizontal nor vertical. This was no doubt designed to reduce the length of the roller. Merioneth Council have a roller that is fitted with pannier water tanks on each side, so that the roller can do a full day's work without refuelling. This roller also is unusual in that it is capable of travelling at 10-12 m.p.h.!

On your travels you may see some of these interesting rollers, and if you go through Ruckinge, near Ashford in Kent, you will see roadside plaques, in the form of road roller smoke box doors, erected in 1951 to commemorate Thomas Aveling, the inventor of the steam roller. A photograph of one of these is reproduced on the first page of this article. These plaques record the fact that Aveling once was a farmer, at Court Lodge in the Parish where they have been erected, and they are also reminders of the Festival of Britain year 1951.



Another Wallis and Stevens engine similar to the one shown above. It has a considerable lock and wide rear rolls.



Gresley Pacific No. 60093 "Coronach" makes an impressive exit from Carlisle for the Waverley Route to Edinburgh. Photograph by the Venerable E. Treacy.

some of the latest air-conditioned, streamlined expresses; improved freight cars, passenger coaches, track layout and signalling, Mr. Wayne Johnston, President of the Illinois Central Railroad, said "Forget any ideas that the Iron Horse is a broken down old nag. Believe me, the Iron Horse of to-day is a frisky young colt!"

In France powerful modern electric locomotives are maintaining extremely fast timings with many of the long distance express and other passenger trains, notwithstanding heavy loading and considerable adverse grading, particularly between Paris, Dijon and Lyons, or Paris to Bordeaux and beyond.

On the Waverley Route

Coronach, the A3 appearing in the accompanying photograph, is about to tackle one of the most difficult 98-mile main line routes in Britain over which heavy through trains are run. This is the former North British line between Carlisle and Edinburgh (Waverley), with its long climbs at 1 in 70-75-80 amid the Cheviot and Lammermuir Hills, many curves and, as often in Scotland or elsewhere when the locomotive is having a hard time, excellent scenery that in places is stern and wild.

The North British Company's Atlantics worked the principal trains for a number of years and did well in the hands of regular, expert crews, but were limited to about 290 tons load if unassisted on the long climbs. Soon after the formation of the L.N.E.R. group I was privileged to ride with the driver and fireman on No. 9906 *Teribus*, hauling the principal day express from Edinburgh to Carlisle, for the Midland line and St. Pancras. As the load was over 300 tons, we had as assisting engine behind us, next to the train, a former Great Northern D1 superheated 4-4-0. It was hard going for both locomotives on the steep hills; a little rough riding, but most instructive and memorable in many ways. Time was nicely kept.

My next such journey was on the footplate of A3 Pacific *Captain Cuttle*, alone at the head of the night sleeping car express when, including a considerable complement of fish, mails and parcels, there was a load of about 390 tons

behind the tender. Up much of the long climb to Falahill summit speed ranged between 33 and 27 m.p.h. We arrived exactly to time at Galashiels, and then made smart running along the easier but undulating grades in historic country through Melrose and St. Boswells to Hawick. From the latter stop, with brief rear-end assistance out of the platform by the station pilot engine, we were launched on the severe 10½-mile climb to Whitrope, beginning with lengths inclined at about 1 in 72, winding up into the often bleak and windswept Cheviots, though it was a calm summer night just then.

Captain Cuttle was master of the situation in the able charge of a most experienced Carlisle driver and fireman both named Kettle, who were father and son! For many miles nothing was visible save for the occasional signal light, assuringly green, a lonely signal box or darkened and silent station. So as to give the probably sleeping passengers as steady a ride as possible, the big engine coasted down the long descents, being steadied by frequent, gentle brake applications. Back in England we sped along to the lights and maze of junctions and tracks at the northern approach to Carlisle, being checked

Overseas Railway Developments

The Canadian National Railways have organised a mobile Museum containing, and also presenting in itself, many relics and exhibits dating from 1836 to recent times. The train travels for exhibition on various parts of the vast system on the occasion of local centenaries or other special events, and is also depicted in an excellent film that has been displayed in London and elsewhere. Locomotives include Mogul No. 674 of 1899; a wood-burner No. 40, the first standard gauge engine ordered by the Grand Trunk Company over 80 years ago; and an early type saddle tank "switcher" or shunting design. There are also coaches and sleeping cars restored to original appearance and displays of many relics arranged in three old baggage cars.

In Australia the centenary of the Victorian Railways was celebrated recently in Melbourne, where intense suburban services are now operated and enterprising plans are in hand to provide improved track, services and plant, with modern steam, diesel-electric and electric traction. Mr. J. Knowles writes that in Queensland post-war development has by no means neglected the steam locomotive. Fine 3 ft. 6 in. gauge Pacifics built in Britain by the Vulcan Foundry Ltd., although possessing a driving wheel diameter of only 4 ft. 3 in. and limited to 45-50 m.p.h. maximum speed, have enabled an average speeding-up of main line passenger train timings to be effected with a margin in hand. More were ordered lately, for local construction. Other developments he mentions include the introduction of air-conditioned mail trains, four-car motor sets, 12 4-6-4Ts for Brisbane suburban services and the considerable use of C17 light, mixed traffic 4-8-0s.

While addressing the New Orleans Chamber of Commerce on the subject of American (United States) Railroads' new equipment and techniques, describing

Railway Notes

By R. A. H. Weight

Wrong line working on the Southern with No. 31327, an 0-4-4 tank, passing a contractor's locomotive "in possession." Photograph by D. Ives.

by signals so that finally we stopped a few seconds late in Citadel station, where two L.M.S. locomotives took over to work the train forward to Leeds, after some remarshalling.

This was in the earlier days of the A3's long continued prominence on the Waverley route.

Southern Travels and Tidings

Diesel 0-6-0 shunting engines have taken up duties at Brighton, Three Bridges and Horsham, including Nos. 13092-4; No. 13095 was allocated to Hither Green and No. 15234 to Eastleigh. B.R. class 3 2-6-2Ts stationed at Exmouth Junction have been noted on the former West Country class slow passenger turns between Exeter and Plymouth via Newton Abbot, W.R., where new sister engines are also stationed.

Dorchester shed is now mainly a servicing depot only, and the few tender locomotives lately stationed there have moved to Bournemouth or Eastleigh as their home station.

The 4-4-0 express ex-L.S.W.R. Class L12 is extinct, as No. 30434 has been withdrawn. So have C 0-6-0 No. 31513; small P 0-6-0T No. 31555 and D 4-4-0 No. 31746.

A temporary signal box and crossover established between Hastings and Rye during repair of Fairlight Tunnel are visible in our illustration of a local train worked by H tank No. 31327.

Along Sussex coast lines whereon nearly all the regular passenger services are electrically operated, I travelled by the Hastings-Birkenhead through steam service each way between St. Leonards and Brighton behind an L 4-4-0 east of Eastbourne and L.M.R. type class 4 2-6-4Ts on the other stage. After watching a Wainwright D 4-4-0, vintage 1901, take over for the non-stop run to Redhill, where the Kent portion would be attached, I boarded the through Bristol and Cardiff train at Brighton to travel part of the way behind a West Country Pacific, then made my way to the Midhurst branches, on which passenger services have since been withdrawn. An elderly one-coach motor set with M7 0-4-4T No. 30051 took me through to Petersfield, Hants., terminating at a small separate platform now to be abandoned, close to the direct Portsmouth main line,



At Midhurst we passed another M7 and a Q 0-6-0 marshalling sugar beet wagons into the freight train which will continue to run to and from Pulborough.

A special and very full corridor train organised by the Railway Correspondence and Travel Society, traversed those branches, headed by rebuilt radial 0-6-2Ts Nos. 32570 and 32576. It had previously travelled from Guildford to Horsham and afterwards over another pretty but non-paying single line on the eve of closure through the Meon Valley, by then headed by two T9 ex-L.S.W.R. 4-4-0s Nos. 30301 and 30732.

Another Meon Valley special to Fareham and Fratton was hauled by D1 rebuilt Wainwright 4-4-0 No. 31739, far from its usual Eastern Section travels. *South Foreland*, an H2 Atlantic, also on strange ground and beautifully turned out like the other selected locomotives, had worked the 10-coach first-named excursion by an unusual route from Waterloo to Guildford.

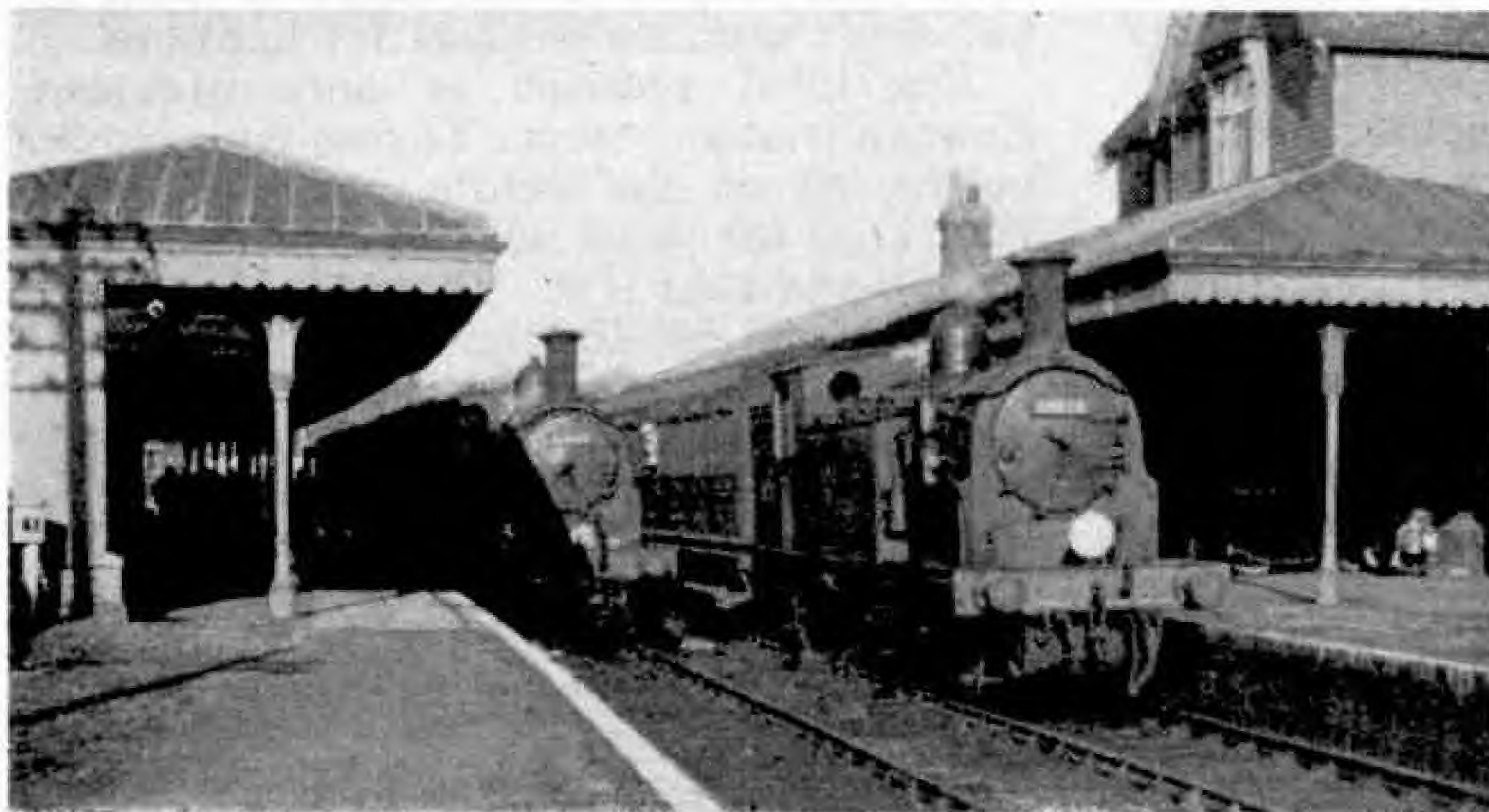
Eastern and North Eastern News

New class 9 2-10-0s numbered 92043-4 were allocated to 31B, March, and No. 92042 to 35A, Peterborough. Additional B.R. 2-6-4Ts built at Brighton went to 33A, Plaistow, numbered 80099-103. More of the older L.M.R. type class 4 tanks moved from Plaistow to Neasden, and two went to Hitchin. Diesel-electric shunters added to stock included Nos. 13153-7, to be stationed at 40B, Immingham, and No. 11502, of the small diesel-mechanical type, to 32B, Ipswich.

Class N4 is extinct. These engines dated from 1889, being 0-6-2Ts having Joy valve gear. They belonged originally to the Manchester, Sheffield and Lincolnshire Railway, afterwards the Great Central.

Sir Clement Royds, No. 62656, is another of the earlier Great Central Director 4-4-0 series withdrawn from class D10; No. 65569, condemned, belonged to the Great Eastern J17 class.

A brace of M7 Drummond 0-4-4 tanks at Midhurst, one pulling and the other pushing its train. Photograph by S. C. Nash.



How to Choose Your Bicycle

By H. S. Williams



Reg Harris in action. Photograph by courtesy of Raleigh Industries Limited.

DO you want the machine for short jaunts, or for longer rides, around 60 miles or more? For the former any comfortable and easy running mount will do. A cycle required for runs up to 100 miles in a day should be a lightweight, and remember that lightness in wheels is more important than lightness in frame. The total weight of the machine should not exceed 28 lb., although, by choice, my own mount is heavier.

All cycles have a frame size in inches—16, 18, 19, 20 and so on up to 24 in. for the very tall rider. It is most important to get the correct size, to combat any likelihood of whip in the frame, which is caused by having too much saddle pillar or handle bar stem protruding from the frame tubes. The size of frame should correspond to your inside leg measurement, from crutch to heel, less 10 or 11 in. For example, if a boy's inside leg measurement is 30 in. his machine should have a 19 or 20 in. frame.

For cycling short distances, flat or upturned handle bars are quite satisfactory, but medium and long distance riding necessitate a flat or "dropped" bar. This makes for more comfort over a long distance. With a flat bar, the handgrips should not be above the level of the saddle peak, and with dropped bars, the central level portion should be at saddle peak level. The dropped part of the bar should be 2-4 in. below the saddle height.

So much for weight, size and bars, but there are still some important points to consider. First come frame angles. These

may be a little confusing to the newcomer to the cycling game, but take heart; not all clubmen could say right off what is what in frame angles. The frame angles usually quoted in catalogues are those between head and seat tubes in relation to the top tube. These would appear in a cycle manufacturer's specification, as 68 deg.—68 deg. They are the most comfortable for ordinary touring purposes. Riders who wish to do more racing than touring would choose a more upright frame of say 71 deg.—71 deg.

Wheels should be 26 in., which is the diameter from tread to tread of a wheel fitted with a properly inflated tyre. The racing man on his upright frame usually fits 27 in. wheels, which roll better on his type of frame. The saddle should be comfortable, with a "hardness", for the softer the saddle more effort is wasted, but don't sacrifice comfort for hardness.

The ideal position is only obtained through trial and error. To find your saddle height, sit on the saddle and place your HEEL on the pedal when it is at its lowest point—and that is it. This will mean that your leg will be slightly bent when riding.

The peak of the saddle, its forward point, should be two to three inches behind the imaginary line drawn vertically from the bottom bracket assembly. The third point of this "human triangle" is given by the hands, and these should rest on the handle bars in a natural position, so that the weight of the body is equally distributed on the feet, seat and hands.

BOOKS TO READ

Here we review books of interest and of use to readers of the M.M. With certain exceptions which will be indicated, these should be ordered through a bookseller.

"THE LANCASHIRE AND YORKSHIRE RAILWAY IN THE TWENTIETH CENTURY"

By ERIC MASON (Ian Allan 25/-)

The "Lanky" as it was popularly known, or the Business Line as it called itself, was a railway of considerable interest. Its title indicated the districts it served so well, but in addition to its own services it worked closely in association with neighbouring lines. Its activities during the later, more respectable period of its existence are covered, for during an earlier period its shortcomings had been a byword in Lancashire and Yorkshire.

The book is written with authority, for the author himself served on the L. & Y. and it is neither a history as such nor a locomotive book entirely. Instead, it is a pleasant informative account of the line and its activities. Necessarily the geography of the system is sketched and the layout of the principal traffic centres is given attention. All this helps very much towards the understanding of the story in which train services, engine workings and other activities all have their part.

The well-kept Lancashire and Yorkshire locomotives of course are given plenty of attention, from the high-wheeled Atlantics, the quaintly-named "Sea Pigs" and the ponderous 0-8-0s and burly 4-6-0s to the quaint and still numerous "Pugs", the familiar 2-4-2 tanks in all their major and minor varieties, and the skittish rail motors.

Incidents on the line, special occasions, mishaps and other events all find their place in the book, and it is fascinating to read in it of many of the drivers of the time and their well-loved charges. On the whole, it gives a complete picture of the railway, with its "Club" Trains, its Continental expresses, its "Wakes" excursions and the multitude of services that built up its reputation as the Business Line. Many trains and engines appear in the illustrations, which are plentiful, and there are also diagrams and two appendices giving much information on dimensions, gradients, etc. Finally, there is a folding map of the system that helps considerably in the following of the author's tale.

"SHIPS OF THE CUNARD LINE"

By FRANK E. DODMAN (Adlard Coles 12/6)

The British and North American Royal Mail Steam Packet Company, forerunner of the present Cunard Steam-Ship Company, was formed in 1839 by Samuel Cunard and his associates to operate a regular mail service from Liverpool to Halifax and Boston, for which they had obtained a seven-year contract from the British Government. They undertook to build three ships, which were to sail fortnightly during eight months in the year and once a month during the winter. "The first crossing was made in May, 1840, when the Company's coastal steamer *Unicorn* crossed to Halifax in fourteen days", and the regular mail service began on 4th July that year, when the *Britannia* left Liverpool for Canada. From this modest beginning grew the great Cunard shipping company of today, with which in 1934 was merged the White Star Line.

The *Britannia* of 1840 was a wooden paddle steamer with auxiliary sail, like all the early vessels built for the Company. Throughout their long history the Company have been quick to take advantage of new advancements in ship design and construction. From wooden paddle steamers they progressed by way of iron-built paddle and iron, screw propelled steamers, all with auxiliary sail, to their first twin-screw Cunarder without sail, the *Campania*, which entered service in 1893. In 1904 the Company took delivery of their first turbine-driven liner, the triple-screw *Carmania*.

These and other developments that have helped to

make the Cunard Steam-Ship Company the world-famous organisation that it is today make a fascinating story that is well told in this compact book. The narrative is enriched by many excellent half-tone illustrations of Cunarders past and present, and by 60 neat drawings and silhouettes prepared by the author. There is also a chapter on the present Cunard fleet, deck plans of the new *Saxonia*, the second Cunarder to bear that name; and a complete list of Cunard ships from 1840 to 1954. One of the most interesting of the tabulated lists is that giving a selection of record passages across the Atlantic made by ships of the Cunard and other companies.

"WEATHER"

By REGINALD M. LESTER, F.R.Met.Soc.
(Warne 5/-)

To-day there is more interest in weather than ever, one of the results probably of regular weather forecasts on radio and television. There is of course a practical side to these. This is clearly explained by Mr. Lester in his book, one of the Observer's Book series of Frederick Warne & Co. Ltd., who shows how dependent on weather conditions are agriculture, shipping, aviation and all kinds of transport, as well as our sports and entertainments, good reason for knowing beforehand, if possible, what they are to be. In Sweden forecasts can be obtained by dialling on telephones, just as in this country we dial TIM to find out what time it is.

Dr. Lester's book is really absorbing. In it the reader learns that the origin of our weather is traceable to a number of air masses that are at war with each other, their movements determining the kind of weather that we experience. He explains the details of the now familiar weather maps; distinguishes the various kinds of cloud and explains their importance; and deals also with storms and tempests and with dew, frost and fog, with rainbows, the Aurora, the colours of the sunset and indeed the colour of the sky itself, when seen from various heights. There are two careful accounts of the way in which meteorologists make the measurements that provide them with material on which to base forecasts. Finally, those interested in weather are told just what the amateur meteorologist can do, and this may introduce some readers to a helpful and interesting hobby.

There is a wealth of illustration, in colour as well as black and white.

ABC U.S. AND CANADIAN MILITARY AIRCRAFT

By JOHN W. R. TAYLOR (Ian Allan 2/6)

This latest addition to the popular ABC aircraft handbooks claims to be the only book in the world that includes details of all important types of current U.S. and Canadian Military Aircraft, including helicopters, pilotless aircraft, airships and research machines. The main section contains a half-tone photograph, 3-view silhouette, specification details and notes on recognition features of each of 58 types of aircraft; and a supplementary section devoted to "minor types" includes photographs of, and notes on, 48 other machines, which range from Boeing Flying Fortresses still in service to the Convair XFV-1 Vertical Take-Off aircraft. Pilotless and research aircraft are dealt with in separate chapters, as also are current types of Goodyear airships.

The book will be welcomed particularly for the valuable information that it gives on the complex U.S. aircraft designation systems that result, sometimes, in a particular aircraft being known by a different designation or name by each of the three or four Services using it.



Puxton Church, in Somerset, is as odd inside as it is outside.

During the building of the lower two-thirds of the tower, up to the trefoil band, the foundations began to sink and so the work was discontinued. Some sixty years later, in the middle of the 15th century, this sinking quite suddenly ceased, and so the work was recommenced and an attempt was made to correct the lean and make the upper storey perpendicular. Actually it is not quite perpendicular now, which suggests that the sinking probably continued at a diminished rate for some time afterwards.

Unlike the tower in Pisa, Temple Church tower stopped sinking long ago. The optical illusion mentioned previously is a result of building the tower in two sections, which now lean at different angles.

The name of the church distinguished by this tower also is rather odd. Actually its real name is Church of the Holy Cross and it was built by the Knights Templar, members of a military religious order whose duties consisted in protecting pilgrims on their way to the Holy Land.

During the war Temple Church was destroyed by incendiary bombs, but fortunately the tower itself escaped. Visitors seeing the burnt-out shell of the church often believe that the lean is a result of the bombing. Towards the end of 1953 the Bishop of Bristol announced the final scheme for the reorganisation of Bristol's city churches, and

Bristolians were then relieved to learn that their leaning tower is not to be

IF anyone mentions leaning towers there are few people indeed who do not immediately think of the famous Leaning Tower of Pisa. Pictures of this tower appear in all sorts of places, such as encyclopædias, guide books, the tourist literature of travel agencies, advertisements and so forth, and one could probably be excused for thinking that leaning towers were the monopoly of Pisa.

But in fact we have quite a few of our own in this country, even if they are not quite so big, and do not lean quite so much, as the tower of Pisa.

Probably the most remarkable of our leaning towers is that of Temple Church in Bristol, which was illustrated in the *M.M.* for December 1952. This tilts at an alarming angle and many people are under the false impression that it is dangerous and should be dismantled. The tower is indeed some six feet out of the vertical, but it may relieve some people to learn that it has been leaning for centuries. The lean appears to be more than it actually is, due to an optical illusion.

Leaning Church Towers

By J. C. D. Smith

demolished along with the ruins of other blitzed churches in the city.

Not very far from Bristol there is another funny little church with a leaning tower. This is a few miles from Weston-Super-Mare in a village called Puxton. The village is several miles from any main road, and so this tower is not so very well known. The lean is not quite so spectacular as that of Temple Church, being only about three feet out of true, but this is quite considerable for such a short tower. Like all these leaning towers, it was not designed to lean. The lean results from building on soft alluvial clay.

The church has further oddities within.

The curious appearance of the spire of the church of St. Nicholas, Gloucester, is due to the original spire having been cut down to make it safer as the tower leaned to one side.

The first thing I noticed on entering was that so many things inside were also leaning or were crooked. Most of the oil lamps seemed to be hanging not quite straight, the chancel arch and the walls were not straight, and many of the church decorations were crooked, including an old hourglass stand by the side of the pulpit. The church is interesting too for its queer old 15th century benches. There are very solidly, if a little crudely, constructed, but they are now very porous in places, as generations of woodworms have been dining on them for the last few hundred years or more.

On leaving Somerset we find in the city of Gloucester yet another leaning tower, this time complete with a spire, or at least half a spire. It belongs to the church of St. Nicholas, in Westgate Street, not very far from the Cathedral. The top of the spire is 3 ft. 7 in. out of the vertical, but this does not strike the onlooker as being particularly dangerous. Many unobservant people indeed would not notice the lean at all.

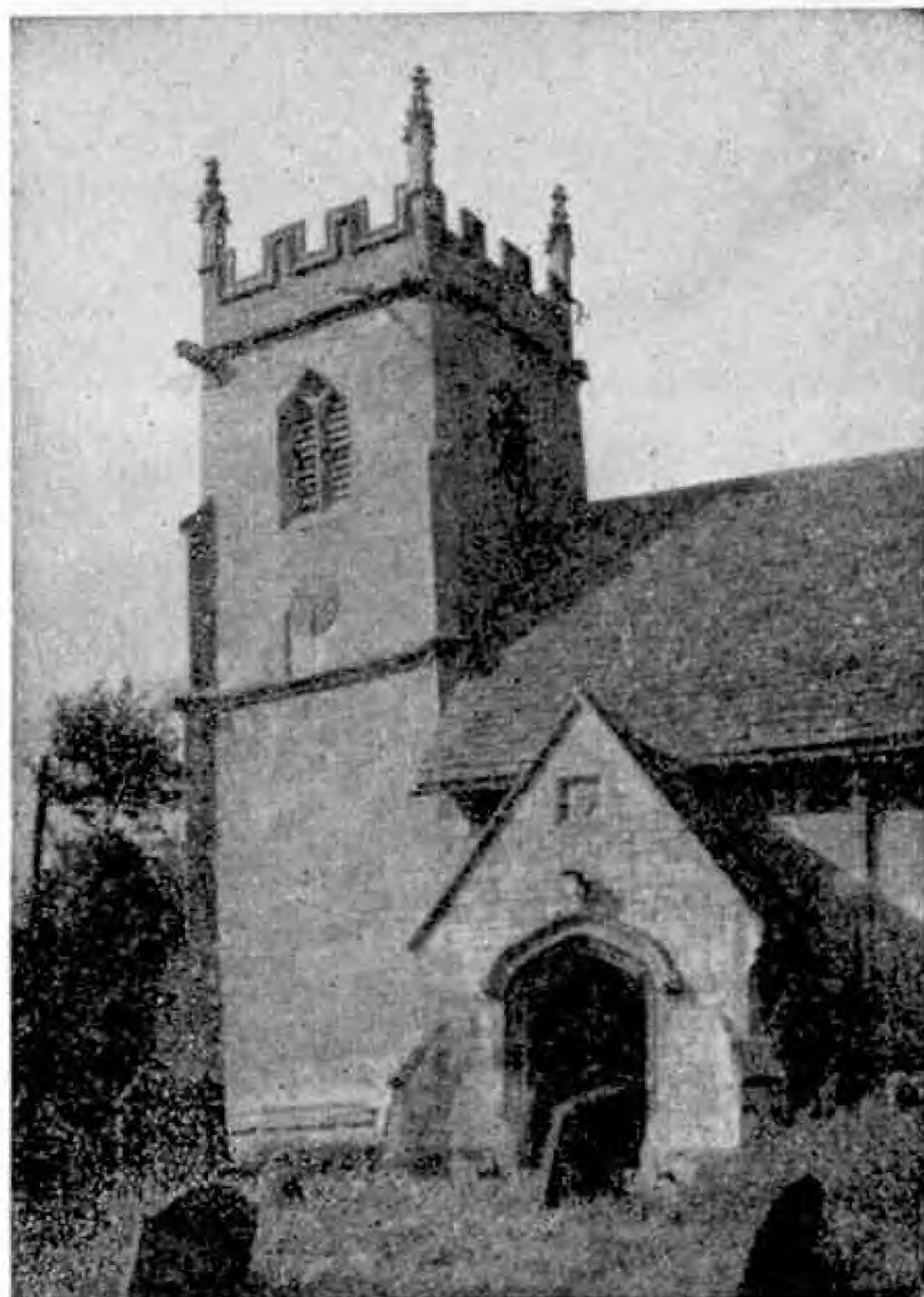


Early in the 18th century Sir Francis Fox was called in to save the spire from collapse and some sixty tons of concrete were poured into the foundations to arrest the sinking, but in 1783 it was decided to truncate the spire for safety.

Yet another leaning tower in the same county can be seen in the Cotswold village of Woolstone, five miles north of Cheltenham. Woolstone and its near neighbour the pretty village of Gotherington are both off the main road and are not mentioned in many guide books, so they too are not very well known to tourists. This tower, built on the hillside, leans about three feet, but again it is not the only thing there that leans. Most of the tombstones in the churchyard are leaning in sympathy!

Travelling across to East Anglia, there is a leaning tower in the village of Surfleet in Lincolnshire, but I have not yet seen it. This 14th century tower is "Perpendicular" in style, but is reputed to be as much as six feet out of the perpendicular.

There must also be several other leaning towers up and down the country, but after all perhaps Pisa still has the king of all leaning towers. It is certainly the highest, for its 179 feet is more than twice the height of that of Temple Church.



Tombstones seen to be leaning in sympathy with the tower of Woolstone Parish Church, in the Cotswolds.

The Vickers Viscount

By John W. R. Taylor

IT is now two years since British European Airways introduced Vickers Viscount turboprop air liners into service on their network of routes throughout Britain and the Continent. They have been wonderful years both for the Corporation, who now operate the finest fleet of modern air liners in Europe, and for Vickers, who have developed the Viscount into one of the great transport 'planes of history, ranking with the Hannibal, Dakota and Empire flying boat.

The proudest moment was, perhaps, on 3rd June 1954, when Vickers were able to announce the sale of three Viscounts to Capital Airlines—the first time that a British air liner had ever been ordered for use on scheduled services in the United States. The contract has

The first Vickers Viscount, the prototype 630, which made its initial flight on 16th July, 1948.

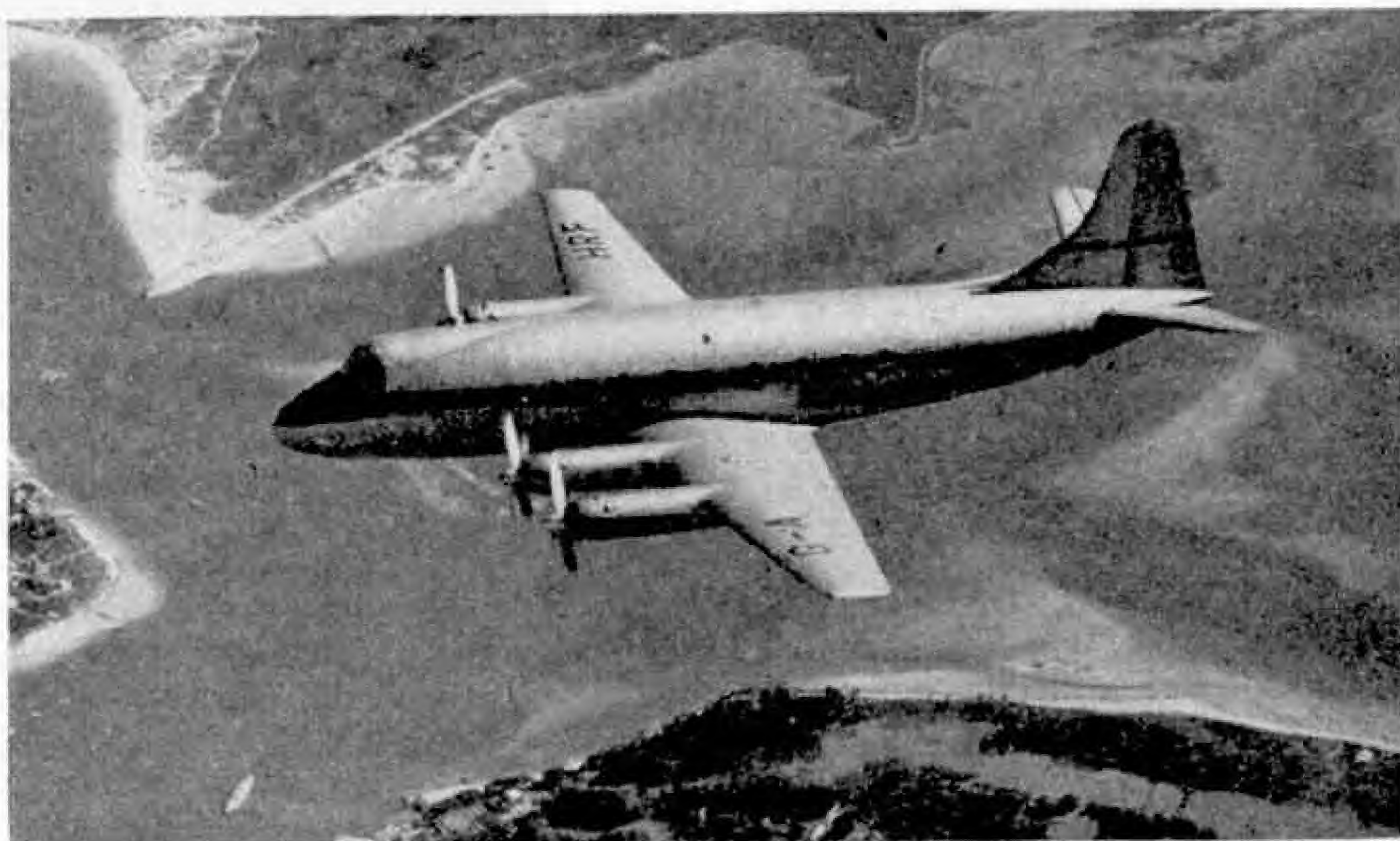
now swollen to no fewer than 60 aircraft, worth nearly £24 million in dollars; and it is only one of many, for already 179 Viscounts have been ordered by 19 customers in every corner of the world, and new sales are announced almost every month.

The credit for this splendid achievement must be shared by both Vickers and B.E.A., for without the Corporation's early confidence in the new and untried turboprop, and their close co-operation at every stage of the Viscount's development, it might have remained just an interesting prototype, too far ahead of its time for acceptance by the hard-headed businessmen who run international airlines.

The co-operation dates almost from the start of the Viscount story, in 1945, at a time when Britain's aircraft industry was poorly equipped to supply B.O.A.C. and B.E.A. with the new aircraft they needed

to meet the challenge of their foreign competitors. For 5½ years production had been concentrated on warplanes, leaving America to build all the transports needed by the Allied Air Forces. In consequence, the Constellation, Skymaster, Convair-Liner and other fine air liners were already on the production line in America; whilst all that Britain's industry could offer were converted warplanes or developments of warplanes, such as the York and Viking.

Determined to back Britain's industry to the hilt, B.E.A. decided to make do with Vikings until new air liners were available, even though they knew this would put them at a disadvantage compared



with their European competitors who had ordered Convair-Liners. The Vikings served them well, building up a tremendous reputation for sturdy reliability and safety. And all the time B.E.A. planned for the day when their new fleet would be ready for service.

It was a gamble; but Britain's industry had to gamble to make up its 5½-yr. handicap. Fortunately, the odds against it were shortened by the fact that it had the world's finest engine manufacturers on hand to supply power plants for the revolutionary new air liners on the drawing boards.

By the time Rolls-Royce had the first of their Dart turboprops ready for test in the summer of 1946, two small teams of specialists, one from Vickers, the other



R.M.A. Discovery, the first B.E.A. Viscount 701. Shell photograph.

from B.E.A., were already working on the design of an air liner powered by four of these new engines.

Because it had no pistons, and very few moving parts of any sort, the Dart promised completely new standards of quiet, smooth, comfortable flying. Absence of vibration meant less wear and tear on the airframe and instruments. The fact that it ran on kerosene reduced the dangers of fire on the ground and in flight. And because turboprops operate most efficiently at high altitudes, an aircraft powered by the Dart can cruise in the clear smooth air "above the weather".

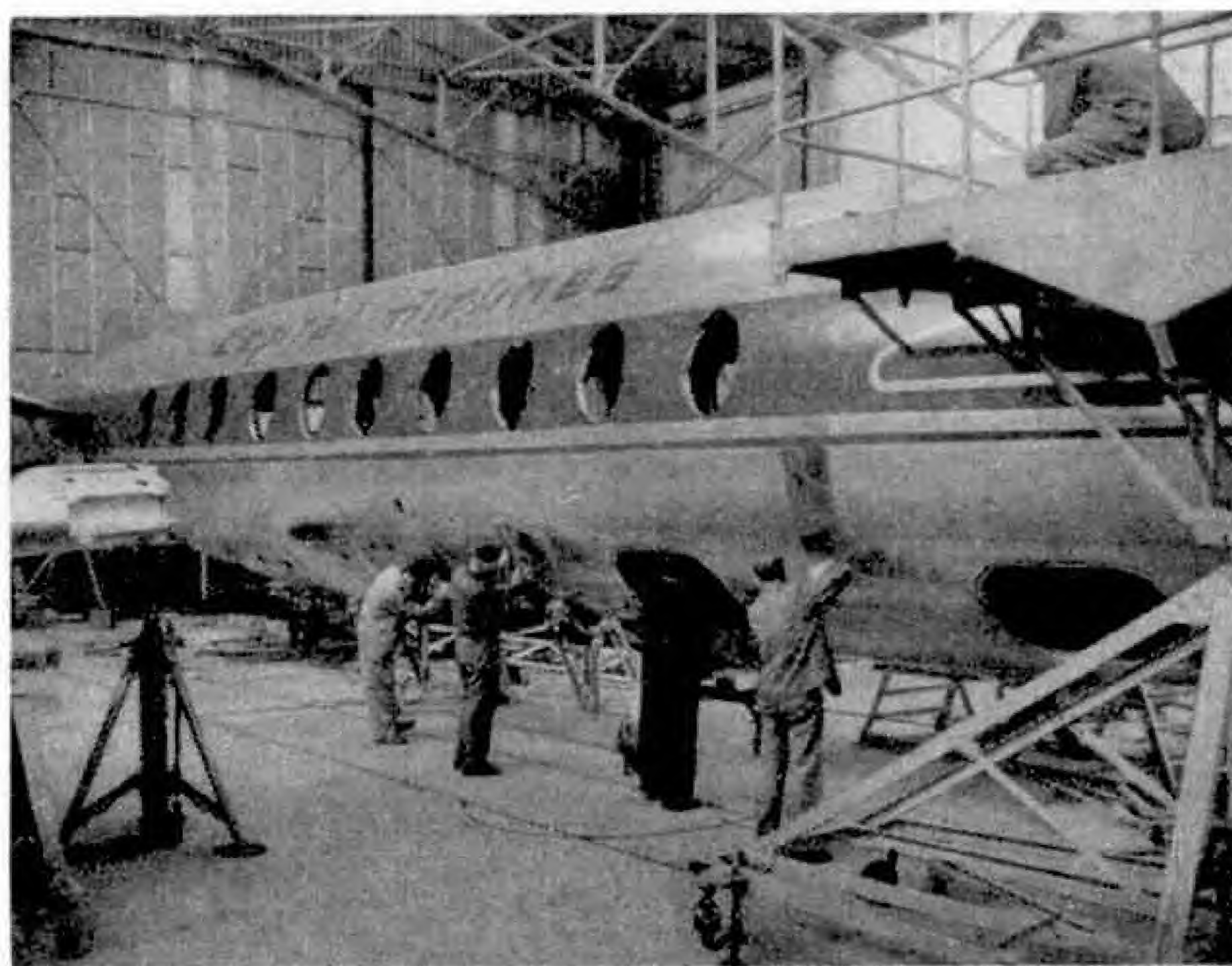
Under the leadership of Vickers' great designer, George Edwards, the Viscount

slowly took shape. The Dart was expected to give about 800 shaft horse power; so the first studies were for an air liner to carry 24 passengers. Soon, however, it became obvious that the production Dart would develop at least 1,000 s.h.p.; so the decision was taken to build the Viscount Type 630 prototype as a 32-passenger machine.

Despite all the problems involved in designing the world's first genuine turbine-powered air liner, Vickers completed the prototype (G-AHRF) by the summer of 1948, and it was flown on 16th July in that year by the late "Mutt" Summers, who said it was the smoothest and best machine he had ever known. Then came

a very thorough test programme, followed by demonstration tours of Europe and tropical trials at Khartoum and Nairobi.

B.E.A. crews played an important part in all these flights; and a major milestone was reached on 29th July 1950, when the Corporation borrowed the Viscount 630 prototype and used it for scheduled passenger service on the London-Paris route. It was also operated



At work on the fuselage of one of the Viscount air liners for Capital Airlines, U.S.A. Photograph by courtesy of Vickers-Armstrongs Ltd.



between London and Edinburgh, and over a period of 26 days logged nearly 138 hrs. flying time, carrying 1,815 passengers, all of whom were immensely impressed by its 300 m.p.h. comfort.

Convinced that the new air liner was a winner, B.E.A. signed a contract on 3rd August, 1950, for 20 Viscounts, and later increased the number to 26.

The Dart had, meanwhile, developed so rapidly that the R.Da.3 version was giving 1,530 h.p. This enabled Vickers to design an improved version of the Viscount, which they called the Series 700, with a longer fuselage accommodating up to 53 passengers, improved performance and a wing span of 93 ft., which was 4 ft. greater than the Viscount 630 prototype. It was this version which B.E.A. ordered, and which was put into production as the Viscount 701 with 48 seats.

At the same time, to give their aircrews and ground staff experience in flying and maintaining aircraft powered by Dart turboprops, the Corporation decided to buy some Darts and have

them installed in two Pionairs (improved Dakotas) in place of the aircrafts' usual piston engines. After conversion by Rolls-Royce, the two very superior "Daks"—named R.M.A. *Sir Henry Royce* and R.M.A. *Claude Johnson*—were delivered in

June and September 1951, and went into service as express freighters between Northolt, Paris, Rome, Milan, Stockholm, Copenhagen, Brussels and other places.

Together they were flown for nearly 2,000 hrs., cruising at 202 m.p.h. at a height of 25,000 ft. As their cabins were not pressurised, the crews had to wear full oxygen equipment; but this was a small price to pay for all the valuable experience gained.

Meanwhile, the prototype Viscount 700 (G-AMAV) had been flown by

Above is shown a Viscount 708 in service with Air France.

The lower illustration shows part of the long assembly line of 11 Viscount fuselages in erecting shop No. 106 at Hurn. The line includes Viscounts Nos. 4 to 10 for Trans-Canada Air Lines.



"Mutt" Summers on 28th August, 1950. A few days later it made its bow at the S.B.A.C. Display at Farnborough, where its fly-past with three of the four engines stopped left no doubt of the safety factors built into the new machine. Tropical trials were followed by a tour of India, Pakistan and the Middle East, before the aircraft was made available to B.E.A. for proving flights in August 1952.

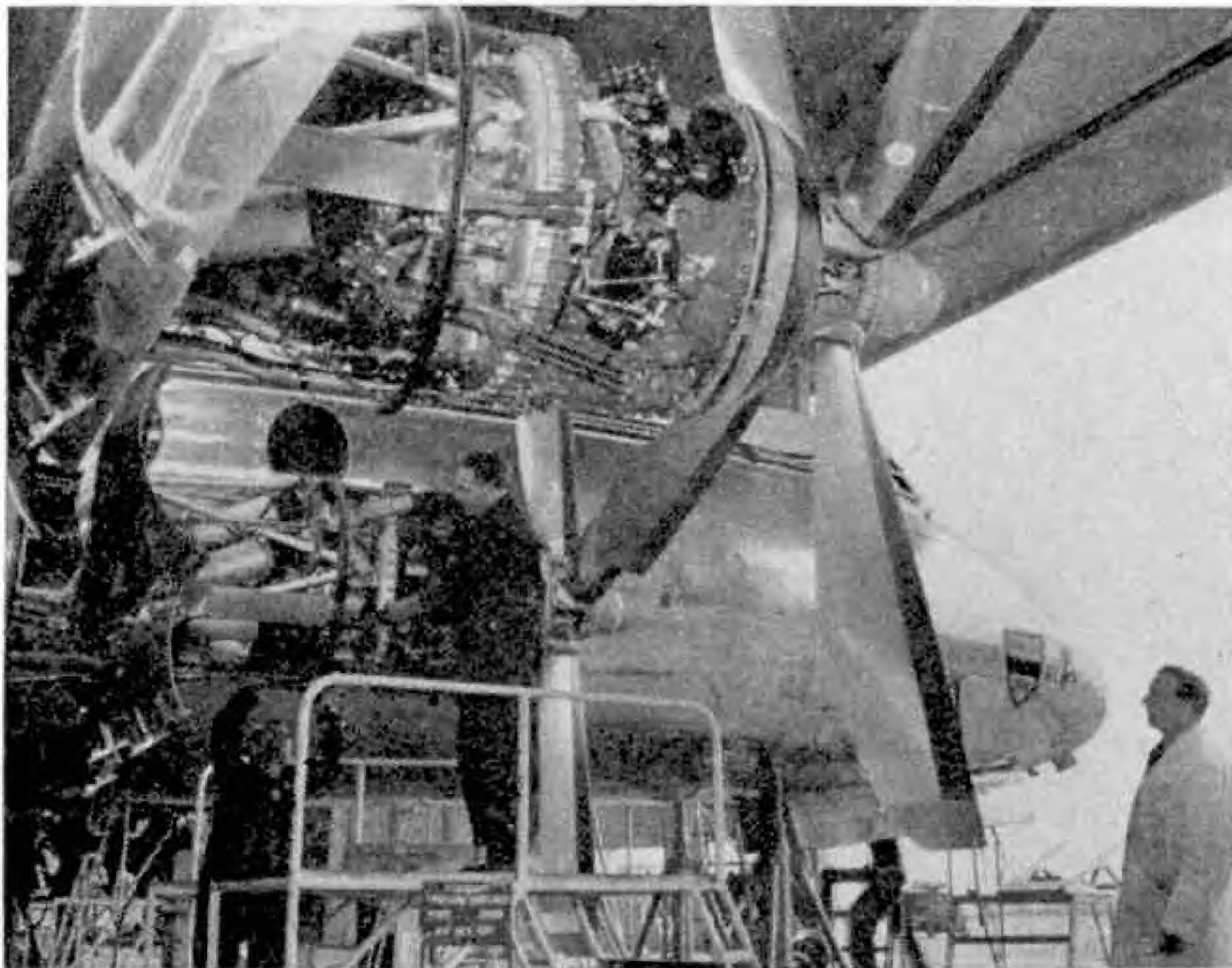
At the conclusion of the trials, Capt. A. S. Johnson, in charge of the Corporation's Viscount Flight, wrote a most glowing report on the aircraft and its engines, with the result that it was soon

Other airlines could not afford to sit back and watch their passengers being taken away by the smooth, fast turboprop air liners from Britain. Air France ordered 12 Viscounts, Aer Lingus four. The first dollar order came from Trans-Canada whose initial contract for 15 aircraft was soon increased to 22. Then came the flood, with orders from Norway, Egypt, Iraq, Venezuela, Hong Kong, India, the West Indies, Australia, and the United States.

B.E.A. might have been expected to feel niggled because these other airlines, some of them competitors, would reap the benefit of their pioneering. Instead, they

offered the airlines—and Vickers—every possible co-operation. In the case of Capital Airlines, for example, they not only gave the Americans full and frank information on operating costs, flying

B.E.A. Viscount undergoing check III maintenance in the Corporation's maintenance hangar at London Airport.



the ambition of almost all B.E.A. pilots, radio operators, stewards and stewardesses to be posted to the Viscount Flight. More and more have achieved that ambition since January 1953, when the first of B.E.A.'s Viscount 701s (G-ALWE) was delivered; and the number will continue to increase, for the Corporation have also ordered 12 of the new Viscount 802s, with 1,697 h.p. Dart R.Da.6 engines and accommodation for up to 70 passengers.

The Viscount was a tremendous success with passengers right from the start. American tourists en route for the Continent began to leave their transatlantic air liners at London, so that they could complete the rest of their trip by Viscount. B.E.A.'s traffic to Switzerland increased by 68 per cent., to Scandinavia by 58 per cent., to Spain by 49 per cent., and to the Mediterranean by 41 per cent.

characteristics, performance, maintenance, serviceability and other factors—many of them highly confidential—but even agreed to give up their place in the queue

for three Viscounts, so that Capital could start operations as soon as possible.

Today, hundreds of thousands of people have sampled the luxury of Viscount travel, and there is little need for me to add my praise. But I recently flew down to Gibraltar in B.E.A.'s very first Viscount 701 (G-ALWE), which is named R.M.A. *Discovery*, as the flagship of the Corporation's Discovery Class. Cruising at 300 m.p.h. above the clouds in bright sunlight at 22,000 ft., it was difficult to believe that a short time before we had been held up by a cold, clammy fog in London. This was flying at its best; and we knew that we should find the Pionair, on which we were to fly from Gib. to Tangier, almost primitive by comparison. This implied no disrespect for the Pionair. It was simply an aircraft from another age, when turboprops were unknown.

Road and Track

By Peter Lewis

THE Italians describe the Mille Miglia, run this year on 1st May, as "the greatest race in the world" and everyone else agrees that it is the most difficult, thrilling and dangerous event in the International Calendar. Nowadays the race starts at 9 p.m. Saturday, when the smallest cars such as the Baby Fiats, Renaults and 236 cc Isetta three-wheeler minicars accelerate away, followed throughout the night by the more powerful cars.

The fastest competitors do not leave until dawn has broken and are back in Brescia soon after dusk, having motored almost non-stop for a thousand miles. Last year only 50 per cent. of the field finished. Ascari (Lancia) won the race at an average of 86 m.p.h. This year I hope the British

with 1st, 2nd or 3rd, or the applicant can have been classed as a finisher in a 100-mile race.

Incidentally the club badge on the front of a private car carries the name of the member.

A B.R.D.C. member I never tire of watching in action is Major A. P. R. Rolt. This veteran of Dunkirk and Calais, and holder of the Military Cross and Bar, is not only one of the greatest sportsmen in the motor racing game, but also a determined, fast and careful driver who never gives up, however tough the odds. He has an uncanny knack of getting more out of a car than most other drivers in

A Triumph TR2 in the Le Mans 24-hr. race. Photograph by courtesy of "The Autocar."

Aston-Martins, which are "right" for the Mille Miglia course, will have better luck than in previous years.

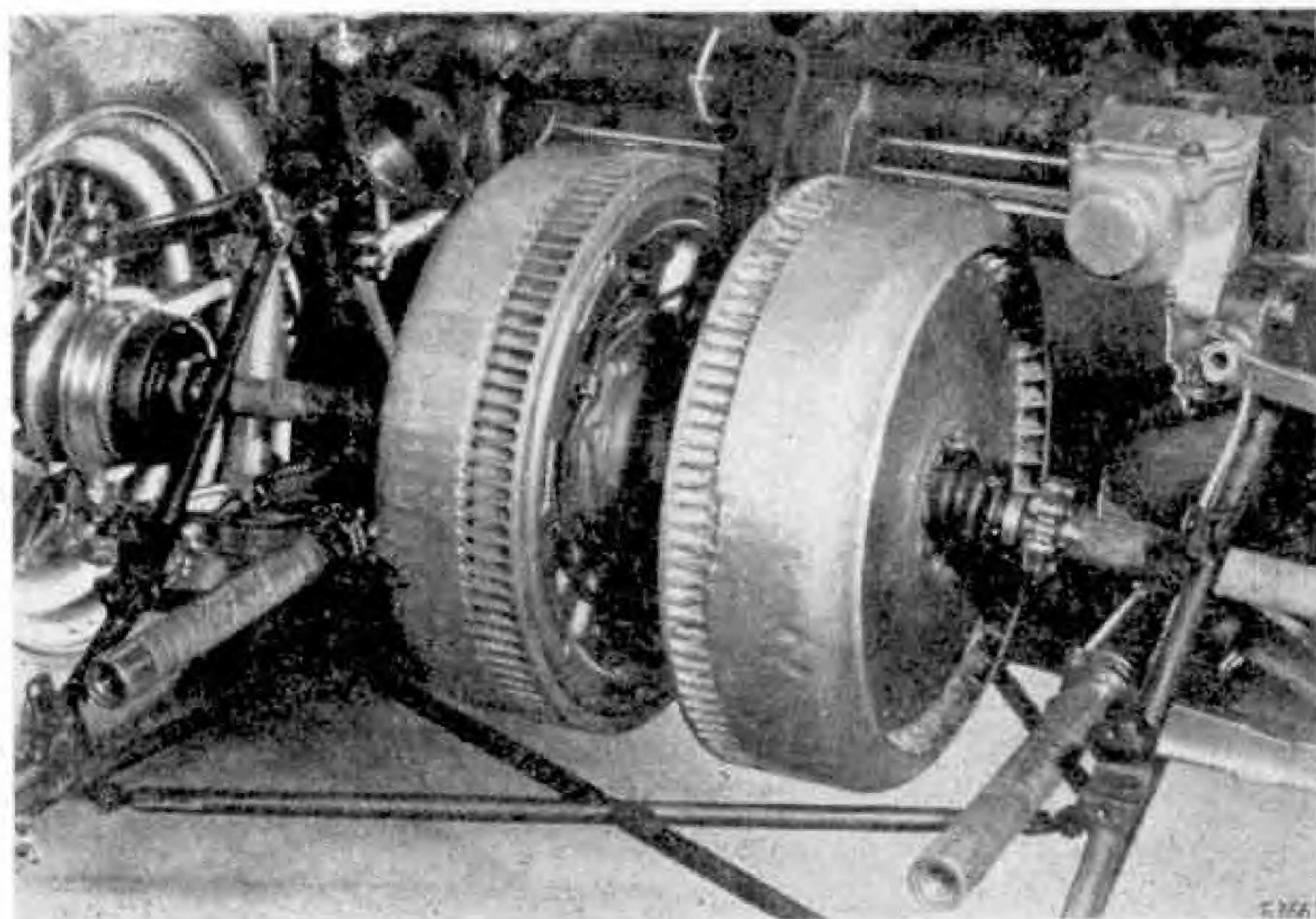
The Silverstone International Meeting on 7th May is organised once again by the British Racing Drivers Club, a select body whose President in chief is the Duke of Edinburgh. The President is Earl Howe and the club was formed in 1928 to promote the interests of motor sport, and to further the interests of British drivers racing abroad. Membership of the B.R.D.C. is strictly limited and newcomers to the sport must comply with the following conditions.

1. They must compete in races for at least one complete season to the satisfaction of the committee.
2. During this season they must drive in at least three races (international or national) of first class importance.
3. Of the three races one must be of at least fifty miles in length and the applicant credited

similar conditions and last season in the Connaught he put up some extraordinarily fast lap times in competition with the Ferraris and Maseratis, particularly at the Silverstone International in May last year, when he finished seventh—the highest placed British driver. I am one of many who would like to see Tony Rolt drive one of the top Formula I cars for a full season, but unfortunately his business commitments do not permit this.

On 22nd May, in the tiny principality of Monaco, Round 2 of the 1955 World Championship takes place. It is the Monaco Grand Prix, selected as the European Grand Prix this year, a "round the houses race" in the truest sense and





The front wheel brakes of the Mercedes-Benz racing car are fitted on the centre line of the chassis, and have very large drums, as our picture shows.

Although this famous race counts towards the Championship, the European Grand Prix equipes do not compete, for the nature of the circuit—like a saucer with tight, banked left-hand turns—calls for a special type of car.

Only the fastest entrants in practice are allowed to start in this gruelling race and last year the 33 starters had all put in qualifying

a gruelling one because of the scores of corners and the narrowness of the road, flanked by buildings and walls.

At Monaco we shall see Mercedes in action again. Their 2½ litre unsupercharged engines have eight cylinders in line—not the more usual V formation—and fuel injection. The designers have very cleverly reduced the bonnet height, and at the same time the frontal area, by tilting the engine on its side—so much so that the axis of the engine lies in an almost horizontal plane. Each cylinder has two plugs and there are two separate magnetos.

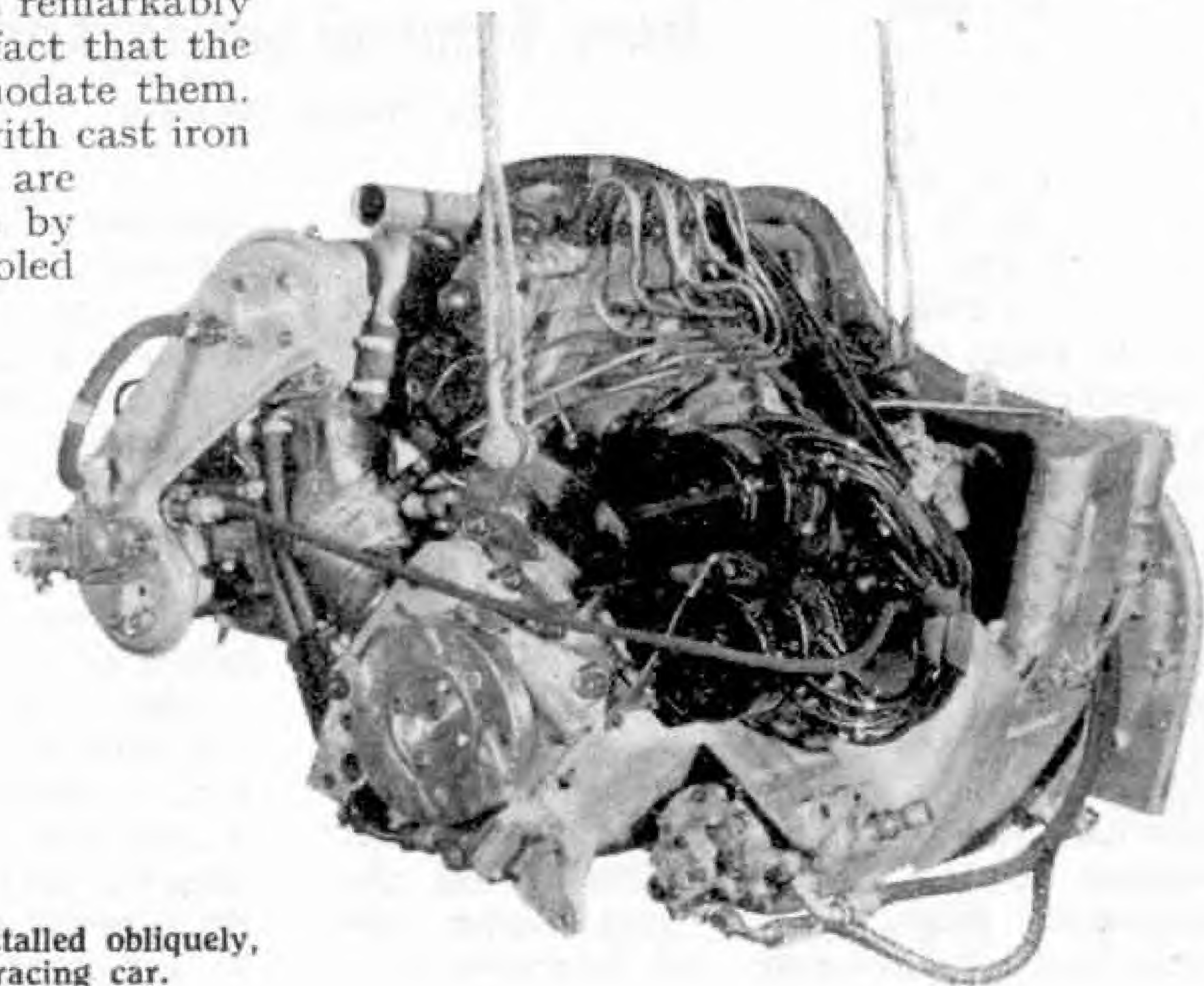
The five-speed gearbox is built in with the final drive at the rear of the chassis and the brakes are of the inboard type, mounted towards the centre line of the body and not attached to the wheels, with a remarkably large drum area—so large in fact that the wheel hubs could not accommodate them. The drums are of light alloy with cast iron liners, and the brake linings are driven from the road wheels by shafts. The front brakes are cooled by air passing through the radiator, the rear ones from a special duct which directs air not only on to the brakes but on to the gear-box as well.

A week after the Monaco race, Round 3 of the Championship takes place—the Indianapolis 500 Mile Sweepstake, and America's biggest motor racing event.

laps at 137 m.p.h. or more, the fastest being 141 m.p.h. Thirty-five year old Bill Vukovich won the race at an average of 130.840 m.p.h., with only two pit stops in five hundred miles, and his prize money totalled 74,000 dollars, or £26,500!

The Le Mans 24 Hour Race, on 11th and 12th June, has 26 British cars in the list of 60 starters, including two Triumph TR2 "works" cars. This remarkable, low priced mass-produced car is unique in that it was designed around components already in production and surprised the manufacturers by performing better and costing less than they had expected.

The 4-cylinder engine, developing 90 b.h.p. at 4,800 r.p.m., is basically Standard Vanguard; (Continued on page 284)



The eight-cylinder in line engine, installed obliquely, of the Mercedes-Benz 2.5 litre racing car.



The up Inter-City leaving High Wycombe, its last stopping place before Paddington. The engine is No. 5031 Totnes Castle. Photograph by E. R. Wethersett.

I WAS waiting on the platform at Snow Hill, Birmingham, with eager anticipation as No. 7026 *Tenby Castle*, sporting a smart headboard above the reporting number, bustled in from Wolverhampton at the head of *The Inter-City*, because I was going to ride on the footplate to Paddington. There was not much time for introductions as the engine stood there, sizzling with impatience, but I was quickly made to feel at home. "We'll get you there right time" said Engineman S. W. Roden with hearty confidence, in which Fireman Lewis joined; and Motive Power Inspector Parcell, of Birmingham, who had come along to travel with me, was also bright and eager to produce a good run for a representative of the *M.M.* How well this was done we shall see.

Tenby Castle is one of the later engines of the class, which have a higher degree of superheat than the earlier Castles and are therefore provided with mechanical lubrication. So I found that instead of the sight-feed tubes of the traditional Swindon lubrication apparatus, with their fascinating globules of oil moving upward, there was to the left of the reversing screw a large glass-faced dial with a pointer indicating *Oil* or *No Oil* for the guidance of the footplate men. In this respect therefore the cab of *Tenby Castle* differed from that shown in the lower illustration on the opposite page. This does show the speedometer, however, an instrument of

lively interest at any time, and also "our little friend in the corner," the audible cab signaller, part of the automatic train control apparatus developed by the former G.W.R.

The exit from Snow Hill is sharply inclined, and we got away quickly, the screw reverser being wound back from 45 per cent. at the start, to 18 per cent. and then 15 per cent. at Small Heath, the regulator being correspondingly opened up. As on my Bristol journey, of which I wrote in the March *M.M.*, the cut off and regulator settings were of special interest

to me, and Inspector Parcell, riding behind the Engineman, co-operated to the full by calling out to me on the

On the W.R. "Inter-City" from Birmingham to London

By "North Western"

opposite side of the cab when any change was made and by indicating the nature of the road ahead. Engineman Roden showed himself to be an artist with his regulator and reverser and the engine responded to his handling in a remarkable manner. For most of the run he did not sit down, but crouched forward like a racing cyclist over the screw reverser, watching keenly the road ahead and ever ready with brake valve or whistle should the need arise.

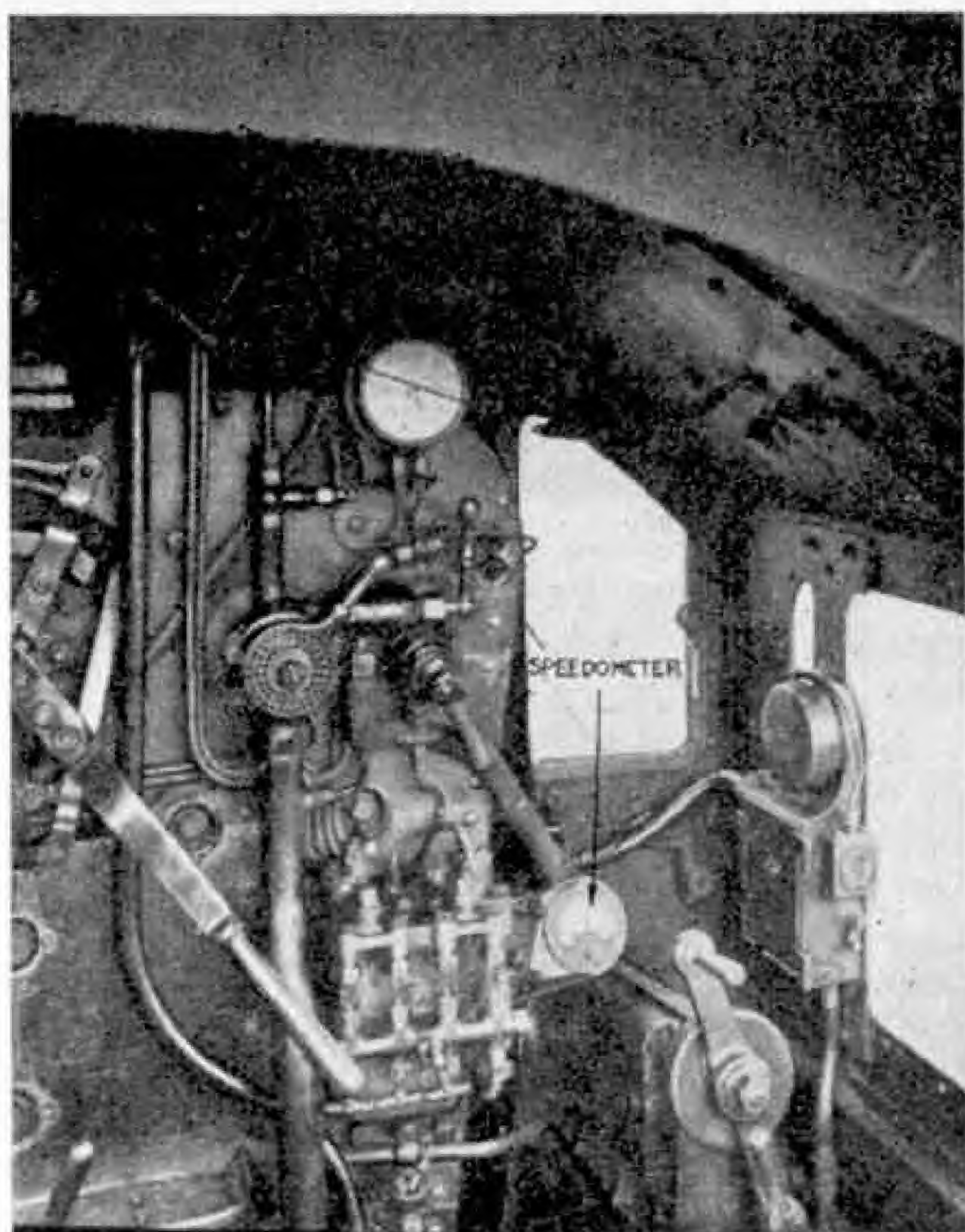
The road hereabouts is gradually rising out through the Birmingham suburbs and with Fireman Lewis tending his fire in the traditional Western way we got along smartly past Solihull and Widney Manor. By Knowle we were already on the descent of just over 5 miles that brings the line

A Castle locomotive with its A.T.C. shoe in contact with the track ramp. Photographs on this page by courtesy of British Railways, Western Region.

down to Lapworth Troughs, and along this length we did some smart travelling. Easy steaming rather than hard running produced 75 m.p.h., before we had to ease for a permanent way slack ahead and we passed gently over a stretch provided with new ballast. The pretty "chopping them off" beat characteristic of the *Castles* and other Western engines was plainly in evidence. We were soon whistling for Hatton North Junction, where there is a speed restriction, and with further fast travelling down the bank we were soon curving left with a long whistle. Leamington now lay ahead, although we were not there yet by some minutes.

Approaching Leamington we were checked by a distant outside. This produced a momentary reaction from the warning siren of the A.T.C. apparatus, with its quite unmistakable "*Wheeeee*", but Driver Roden quickly stopped this by the required working of the acknowledgment handle and began braking, and so we were looped into the platform road to come to a stop at 5.27.

Leamington is on a level stretch and we got away sharply at 5.29, the engine linked up finally to 23 per cent. with the regulator full open. While this traditional handling



was in progress Fireman Lewis took the opportunity to stir the fire a little with the long pricker or bar that had to be drawn from the tender and manipulated so that its business end entered the fire-hole. Then came the more ticklish job of removing it, with the end red hot, and getting it back on to the tender again. This was the only time during the run that the bar was used.

With light but careful firing the boiler pressure seemed a fixture at 225 lb., although we were by now well up on the stretch of 1 in 187 past Fosse Road. After Southam Road the line drops slightly before a further climb of several miles up past Fenny Compton is encountered. Once over the top of the immediate summit we fairly flew over a long straight stretch, but all too soon the regulator was shut and brakes applied as we whistled long and curved to the right approaching Banbury.

The Engineman's side of a W.R. cab, showing the "little friend in the corner" by the side window.

We were actually two minutes down on schedule after observing the service slack through Banbury, in spite of our haste, and so we carried on at speed past King's Sutton, with its finely-spired church, before easing for the troughs and subsequent junction at Aynho.

Here a flying junction marks the divergence from the older route via Oxford of the shortened Birmingham line of the G.W.R. that was opened in 1910. From the restriction to be observed between the junction and Aynho Park Halt we forged ahead, climbing once more, whistling for Ardley Tunnel and beginning to speed again once we felt the benefit of the short level stretch at the summit. By Ardley Station on the descent beyond we had begun to make up some of our lost time and a long straight stretch through a shallow, chalky cutting, followed by open country and an embankment, encouraged our engine to quicken its pace to such an extent that near Bicester we were moving at 80 m.p.h. We just recorded 90—my first—near a now disused wayside station. This was a thrilling performance indeed, one that was thoroughly enjoyed by all of us on the footplate, and

Paddington, the end of the run on the journey described in this article, here seen caught at a quiet moment by the camera of M. W. Earley.

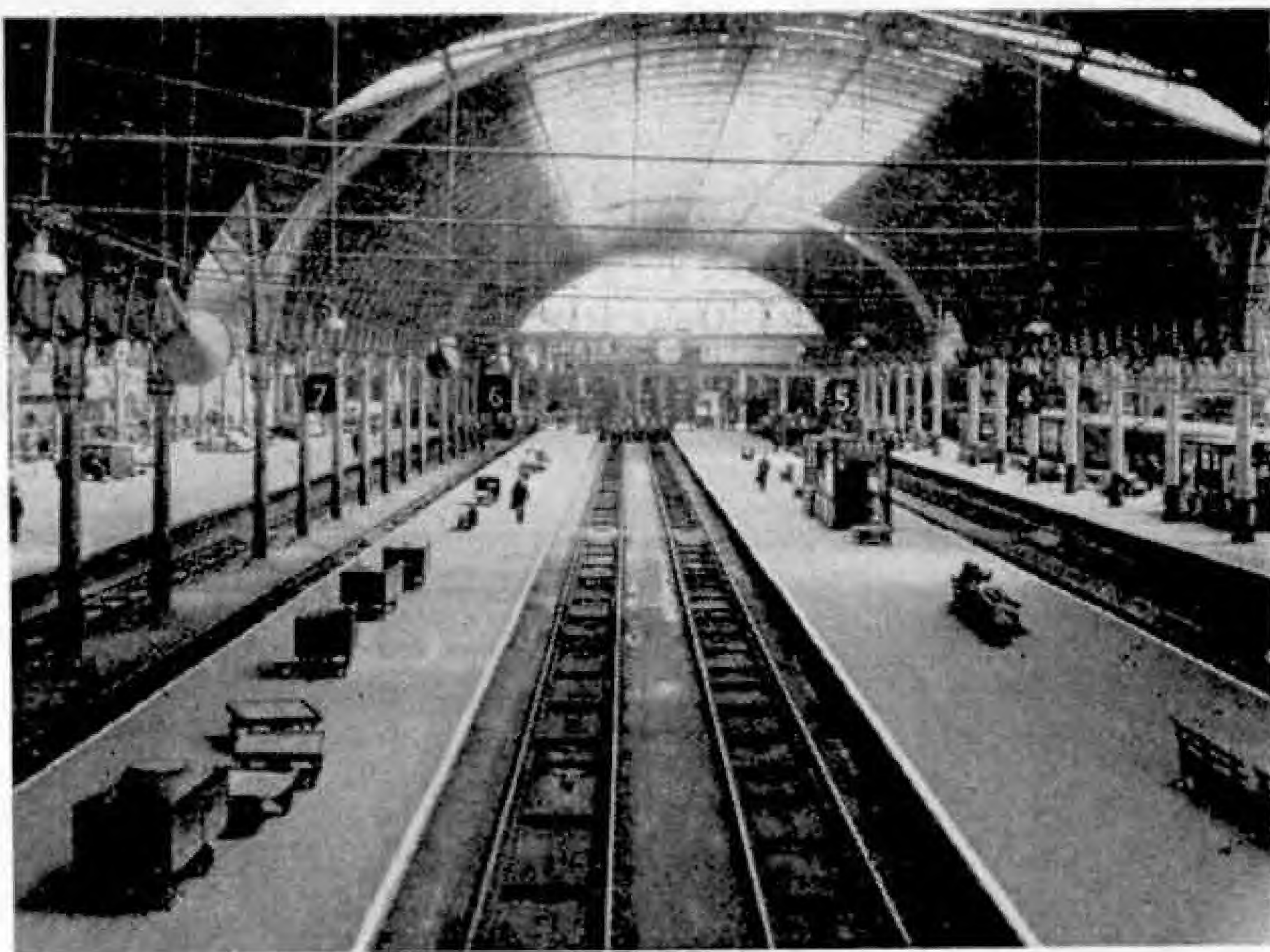
I feel that the engine liked it too.

After the short dip beyond Blackthorn we passed a down express and were soon through Brill and the short tunnel beyond. Then came the easing for Ashendon Junction, where our passing time showed us to be only a minute behind schedule now. Ashendon is another flying junction layout, also subject to a speed reduction, and opening up along the level after this produced some very pretty engine talk from the chimney of *Tenby Castle*. This junction brought us onto the former G.W. and G.C. joint line that extends as far as Northolt Junction.

We bowled along straight stretches before and after Haddenham, climbing again briskly past Ilmer to Princes Risborough. After this station the up line

takes a separate course from the down in order to even out the climb for up trains to Saunderton summit. So we took to our single track through a characteristic chalky cutting, a tunnel, and then more chalk, before rejoining the other track. Once we were over the top Saunderton station flew by and we ran downhill rapidly, until the speed restriction through West Wycombe caused us to check. Then later Engineman Roden was ready with the brakes before a distant at caution approaching High Wycombe caused the A.T.C. siren to wail its warning again. In spite of our gentle approach past a succession of caution signals we got a welcome "two off" and came alongside the platform at High Wycombe on time.

A brief stop and we were quickly away again, full regulator and 15 per cent. being employed once we got down the long straight stretch, bringing us to a viaduct and then a chalky cutting again on a curve. The whistle heralded our approach to



White House Farm tunnel and again marked our exit as we curved to the left still further.

Now the end of our journey was just over 20 miles away and the really hard work was behind us. Firing was eased and the fire-hole doors were closed with the draught flap plate held inside them. From just beyond Beaconsfield the road is downhill practically the whole way into Town. Hereabouts we exchanged whistles with a down train and a green colour-light beckoned us on to our final speed burst of the run, to reach (Continued on page 284)

MECCANO MAGAZINE

Junior Section

Like The Real Thing

A week before Christmas last, Stewart Kelland, of Tiverton, Devon, whose picture you see on this page, had the misfortune to break the drawbar of his Hornby Shell and BP Tank Wagon. Now on both sides of this Tank Wagon are the words "For repairs advise Shell-Mex and BP Ltd.," which appear on the real wagon it represents. Naturally Stewart had noticed this, so immediately he sent off his Tank Wagon to the address given, the accompanying letter plainly showing that he wanted the work done quickly!

It *was* done quickly. Shell-Mex and BP immediately sent the Tank Wagon to the Meccano Service Department, and from there it soon found its way back to Tiverton, fully restored, and ready for traffic.

Ghost Painting

In the great assembly plant of Morris Motors Limited at Cowley, Oxford, what at first glimpse appears to be miraculous painting is now just ordinary routine. Parts that have to be sprayed with paint are carried along,



FRIDAY 25 HOLLY ROAD
COWLEYMOOR
TIVERTON DEVON

DEAR SHELL MEX

IT SAYS ON THE SIDE
TO TELL YOU WHEN IT NEEDS
REPAIRING SO I AM SENDING MY
RAIL TANK CAR FOR YOU TO
DO.

CAN YOU SEND IT BACK BY
XMAS PLEASE.

THANK YOU VERY MUCH

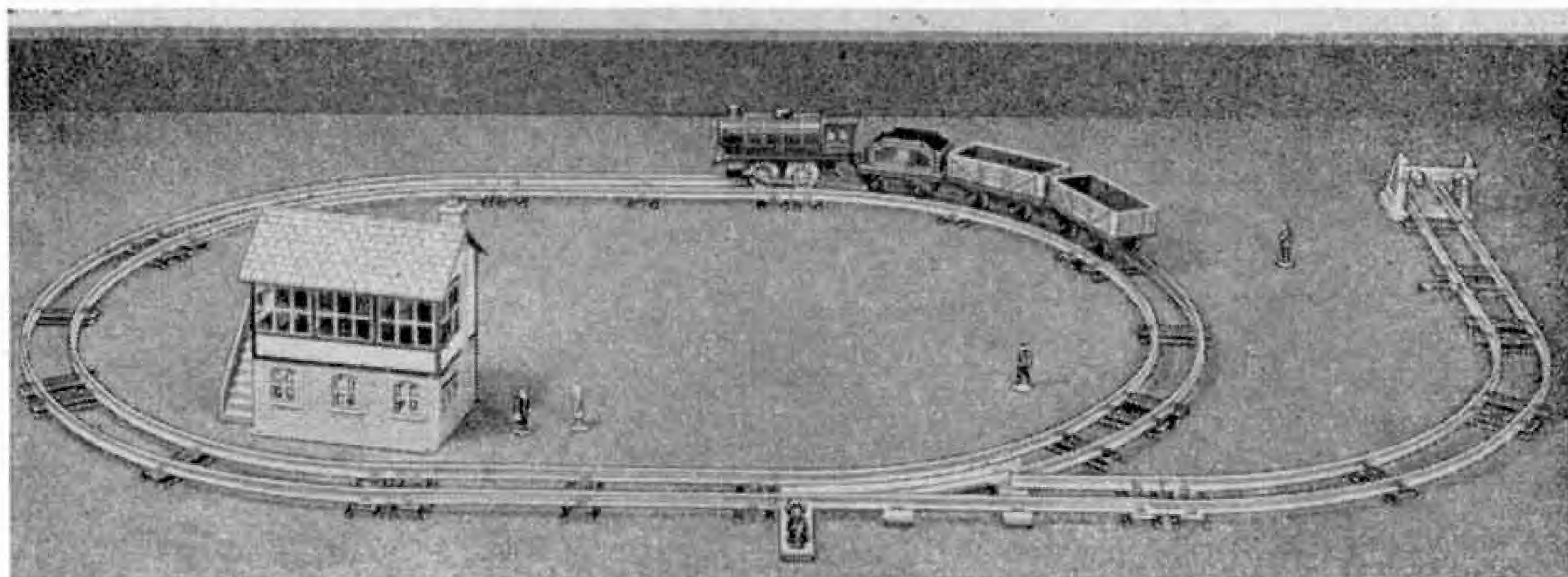
STEWART KELLAND

1 AM 5

suspended from a conveyor, and at one point they are suddenly covered with the paint, which apparently comes from nowhere.

The paint actually comes from an electrostatic paint spray installation. In this it is pumped to a set of hemispherical heads, the atomisers, which are spun round at 9,000 revolutions a minute and charged electrically to a voltage of 90,000. As the hemispheres rotate, the paint moves across to their outer edges, and from there it is hurled through the electrostatic field on to the article to be painted, which of course is the nearest "earth." The particles of this electrostatic spray are so small that they are invisible to the eye, and that is why the paint deposited on the parts appears to have materialised from nowhere.

This electrostatic paint spray installation has cut down wastage of paint to less than 2 per cent., compared with the 50 per cent. or so lost when an ordinary gun was used.



Questions and Answers

By "Tommy Dodd"

THE explanation given last month as to how I got the name that appears at the head of these articles seems to have aroused further interest among Hornby train owners. At all events many more of them have written to me during the past few weeks, and I have been able to solve many problems for them.

Very often I find that it is the oversight by my younger friends and correspondents of some simple instruction or precaution that has caused whatever trouble they may write to me about. So this month I will deal with a few of the points that have cropped up recently. I have already talked about Points—with a capital P!—and I would like now to remind you that attention to small details in the use of ordinary rails is just as important as in the case of Points. Some of you, I am afraid, omit to make quite

sure that you have the correct number of rails in a particular formation. On a large layout it is not easy always to detect that this is so. A careful check of your rail components, remembering that six 1 ft. radius curves form a circle, should soon show you where you may have gone wrong.

Another matter is that the Rail Connecting Plates must be used to hold the rails together at the joints. The connecting pins in the rail ends play their part by keeping the rails lined up properly, but in order to make sure that the track does not come apart at the joints, as it may under the weight of trains constantly running over it, you *must* use the Connecting Plates, which grip the sleepers of adjacent

rails and hold them firmly together. Don't forget that if any of these Plates becomes lost or damaged, as can happen sometimes, you can always get new ones from your dealer.

Another important little point concerns the checking of the rail gauge, especially if the layout has to be put down and taken up each time it is used. There is no excuse for neglecting this, because the handle of the locomotive winding key forms a gauge and the key is bound to be about whenever train running is to begin. If the key is missing you can't run the train anyway; and if you have the key, well then, you might just as well use it to check that the layout is correct throughout.

From the M0 trains that we have been talking about recently I would like to turn now to the M1 Train Sets and components.

These are still within the 1 ft. radius class, so that as far as layouts are concerned M0 and M1 railways can develop in a similar manner. There is one important difference, however. This is that the M1 Locomotive has a reversing mechanism. It may be braked from the track, but it can also be reversed by working the appropriate lever in the cab. With the ability to run the engine backward, train movements that involve tender first running become possible and to many there is a special fascination about working the engine this way round.

As most of you know, there are no separate pieces of M1 rolling stock available, so that if you wish to add to the components that make up a standard set you have to

Above a No. 20 Locomotive and Wagons are running on an oval track to which Left Hand Points and a siding with a Buffer Stop have been added.

make use of the ordinary Hornby No. 1 stock. In doing so there are one or two important things to remember. Hornby No. 1 vehicles are a little more bulky and slightly heavier than the M1 standards, and therefore you cannot expect an M1 engine to take many additional vehicles of this kind, particularly if the original layout is in use. If the track is

This Hornby railway belonging to Mr. A. I. Peddie, of Stirling, is over 30 years old and is still in use, which speaks well for the original workmanship and the care with which the equipment has been maintained.



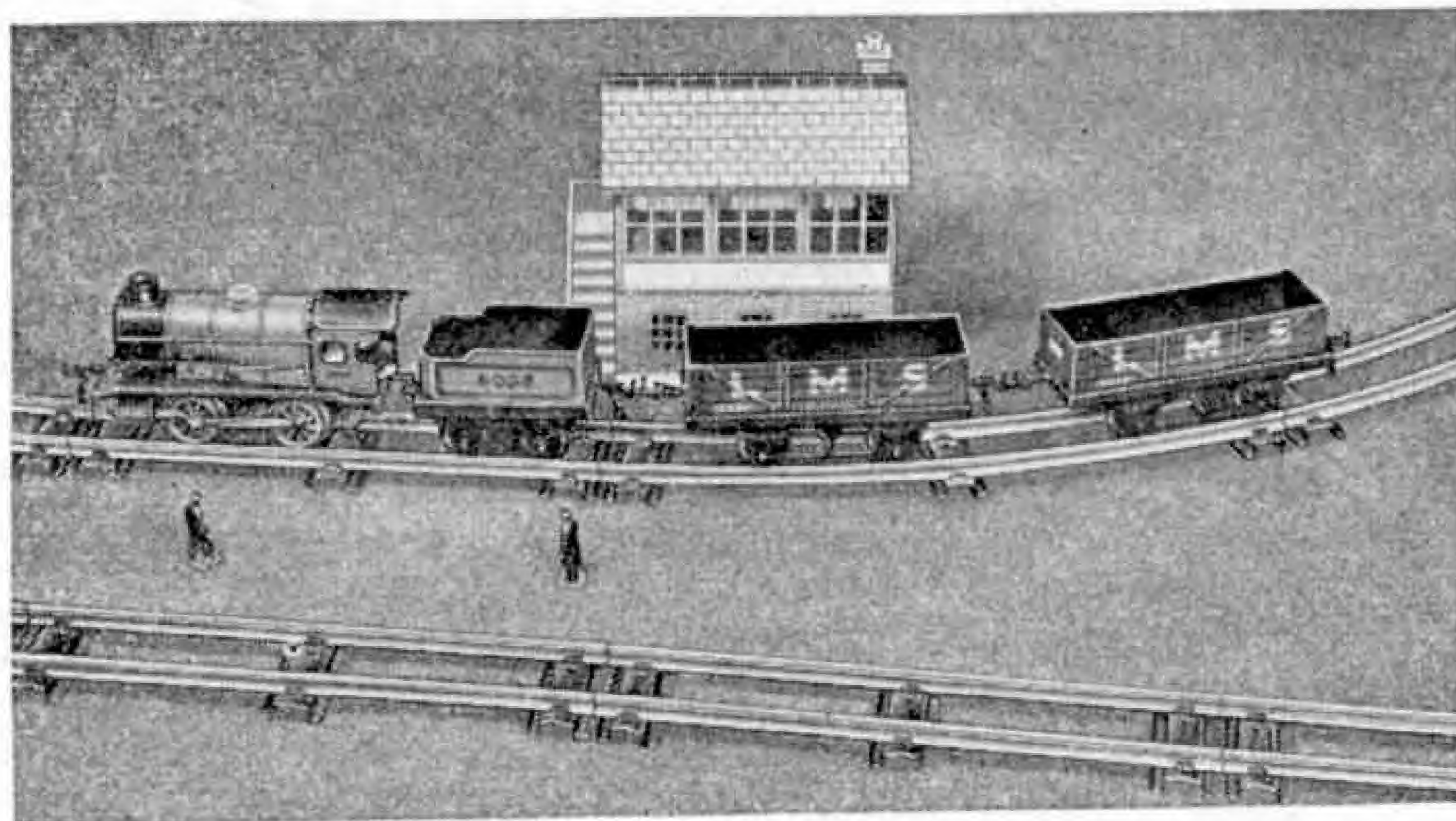
extended somewhat, and there is a fair amount of straight run, then the engine will have a better chance of putting up a reasonable performance with additional vehicles.

A point that worries some M1 operators is that there is a difference in the couplings fitted to M1 and to Hornby No. 1 rolling stock. This, however, does not prevent the two types of vehicles from being joined up. If you make a practice of placing the loop of the automatic coupling of the Hornby

With the M1 Train Sets we make a step forward in the matter of the equipment for braking the train from the track. The BBR Brake Rail is included in M1 Sets, in fact in all Hornby Clockwork Train Sets except the Nos. 20/21 Sets. With this Rail there are three possible

settings of the raised trip piece that is situated between the running rails. When it is central, then it is in the correct position for braking the M1 locomotive, whether this is travelling forward or in reverse. To allow the engine to run by, the trip piece on the Rail has to be moved to one side, and this is readily done by pulling or pushing the extension piece that projects at the side of the track. You can feel when the correct position is reached, as spring pressure causes

Here a Hornby M1 Locomotive with a short train is passing the Signal Cabin. The Wagons are those contained in the M1 Train Set.



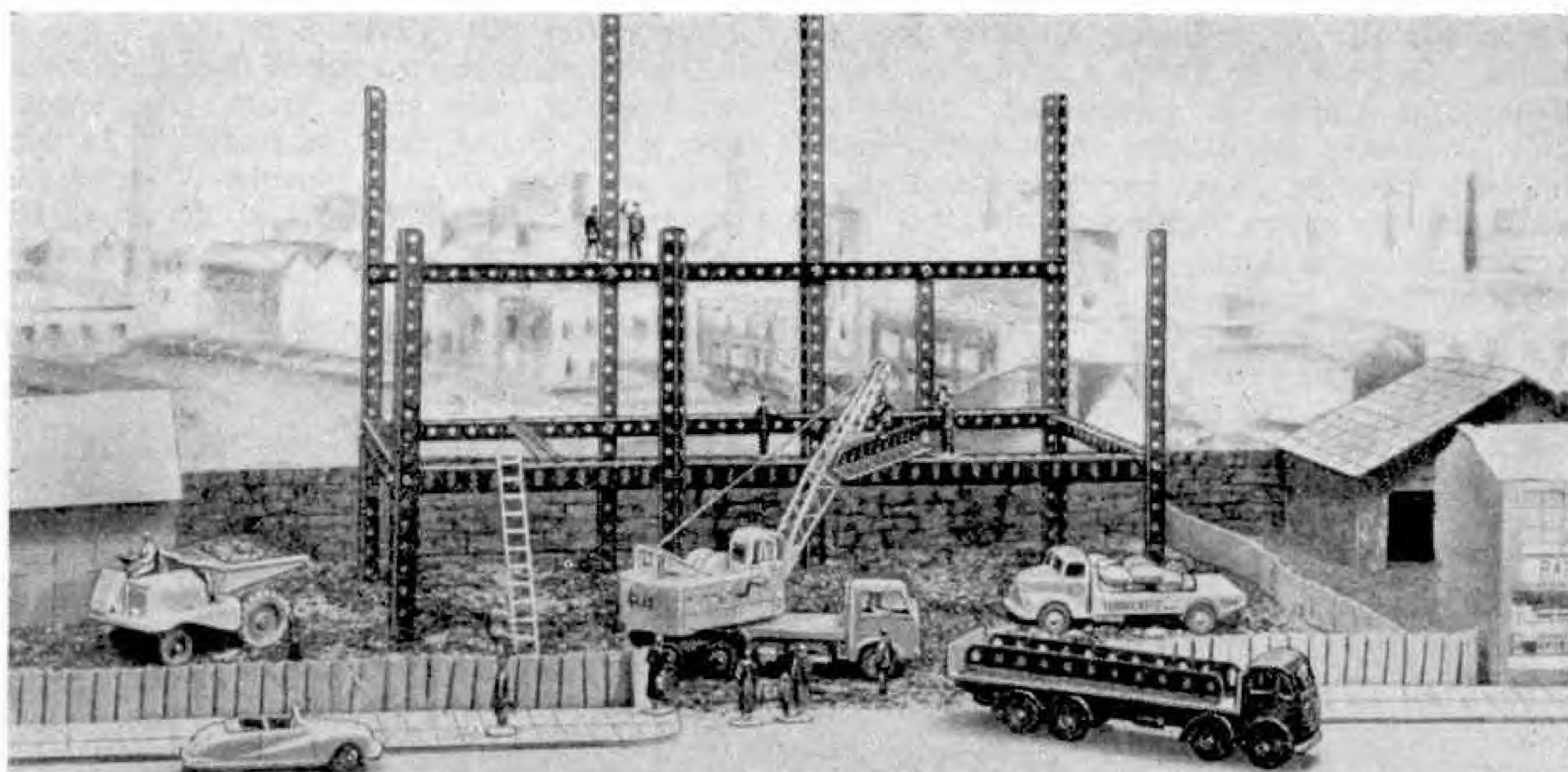
the removable trip piece to "click" into place. A few experiments will soon show you

No. 1 stock over the hook of the coupling fitted to M1 components, then there should be no particular difficulty as long as the engine is pulling the train. I agree that some trouble may arise if the engine is pushing its load, particularly over reverse curves laid with 1 ft. radius rails. But as a rule even the young engine driver or shunter learns how to overcome these little problems, and to enjoy his train running.

how to obtain the best results when running M1 and other engines.

To carry this subject a little further, I might as well tell you that the correct position for the trip for braking the No. 40 Tank is the central one. With the 50 and 51 engines the central position is neutral.

And now, find some more problems to set me!



DINKY NEWS

BY THE TOYMAN

Two New Models with Real Play Value

I KNOW how eagerly every Dinky Toys enthusiast looks forward to the opportunity of adding yet another new model to his collection, for many readers have written to tell me how pleased they have been recently to see the announcement of a new model each month. Now I have even better news for you, as this month two splendid miniatures are being added to the ever-growing range of Dinky Toys and Supertoys. Both models are vehicles, but let me hasten to assure you that there is no lack of variety as they are modelled on prototypes widely differing in appearance and in use.

I will deal with the larger of the two models first, the 20-ton Lorry-Mounted Crane (Dinky Supertoys No. 972).

This is a really superb model, full of fascinating details, and brightly finished in yellow and red enamel. It is included in the newly re-introduced range of Dinky Supertoys, and I am sure all of you will appreciate just what that means in attention to detail and accurate workmanship. It is based on one of the well-known Coles mobile cranes and reproduces all the essential features of the real machine. The crane itself can be swung in a full circle on the firm base provided by the lorry platform, and there

Erecting a new building in a Dinky Toys town layout. Here you see the new Dinky Supertoy No. 972, 20-ton Lorry-Mounted Crane busy at work hoisting steel girders into position.

are separate winding handles for raising and lowering the jib and for controlling the movement of the load hook.

These handles are provided with neat and positive spring mechanisms to enable the jib and the load hook to be set in any required positions. When travelling, the jib is fully lowered alongside the driver's cab, and fits neatly into recesses that prevent the crane from swinging round on its bearing.

A point of special interest is that a lorry driver is seated in the cab, and a miniature crane operator is fitted in the control compartment of the crane itself. By the way, the crane body is hinged at its rear end, so that it can be raised if necessary to

renew the cords. A small slot is provided at the front of the body to accommodate the blade of a screwdriver. To open the body, simply place a screwdriver blade in the slot, and use the screwdriver as a lever to ease the body clear of its spring-loaded catch.

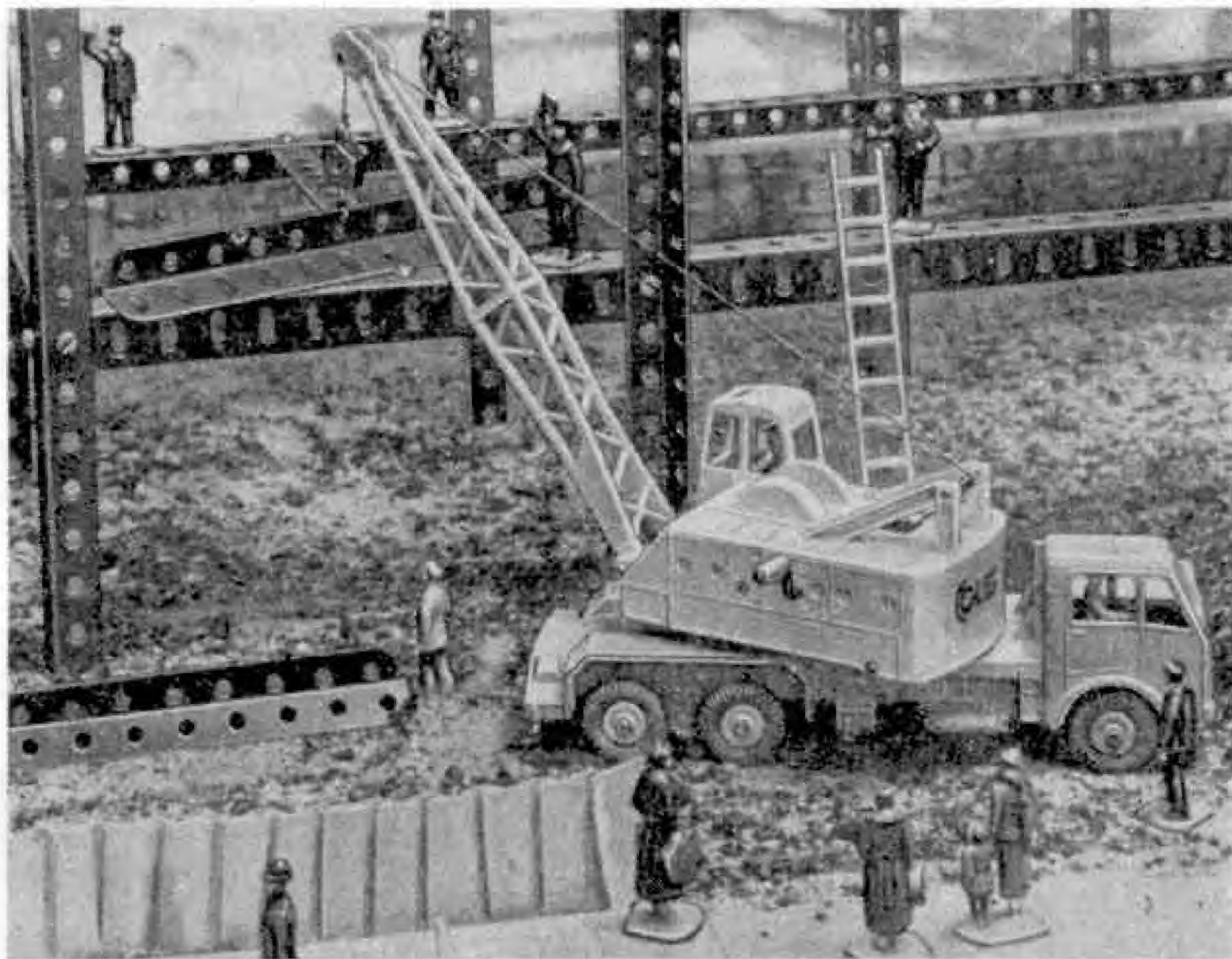
I arranged a special scene to demonstrate just one of the many uses of the 20-ton Lorry-Mounted Crane, and you can judge from the pictures on these pages what a splendid addition this new Dinky Supertoy will make to your layout. My scene

A close-up of the 20-ton Lorry-Mounted Crane, showing the fascinating detail and realism of this superb new Dinky Supertoy.

represents the erection of a typical girder framework for a large building, and of course Meccano Angle Girders and Strips are the ideal medium for the actual constructional work. The Crane can be used for unloading the girders from the lorries that bring them to the site, and for actually raising the girders and manoeuvring them into position in the framework.

Every go-a-head community has undertaken large scale re-building or development schemes since the war, and your Dinky Toys town should be no exception. A building under construction will add life and an air of prosperous development to your layout, and with the new 20-ton Lorry-Mounted Crane you can have a lot of fun actually erecting the building on its site.

The second new model, although smaller, is no less fascinating, and is sure of a hearty welcome by every collector. Since the introduction last year of the G.P.O. Pillar Box many enthusiasts have pointed out that although they had Postmen to deliver the mail, no Royal Mail Van was available to make collections and carry parcels, and consequently their Postmen

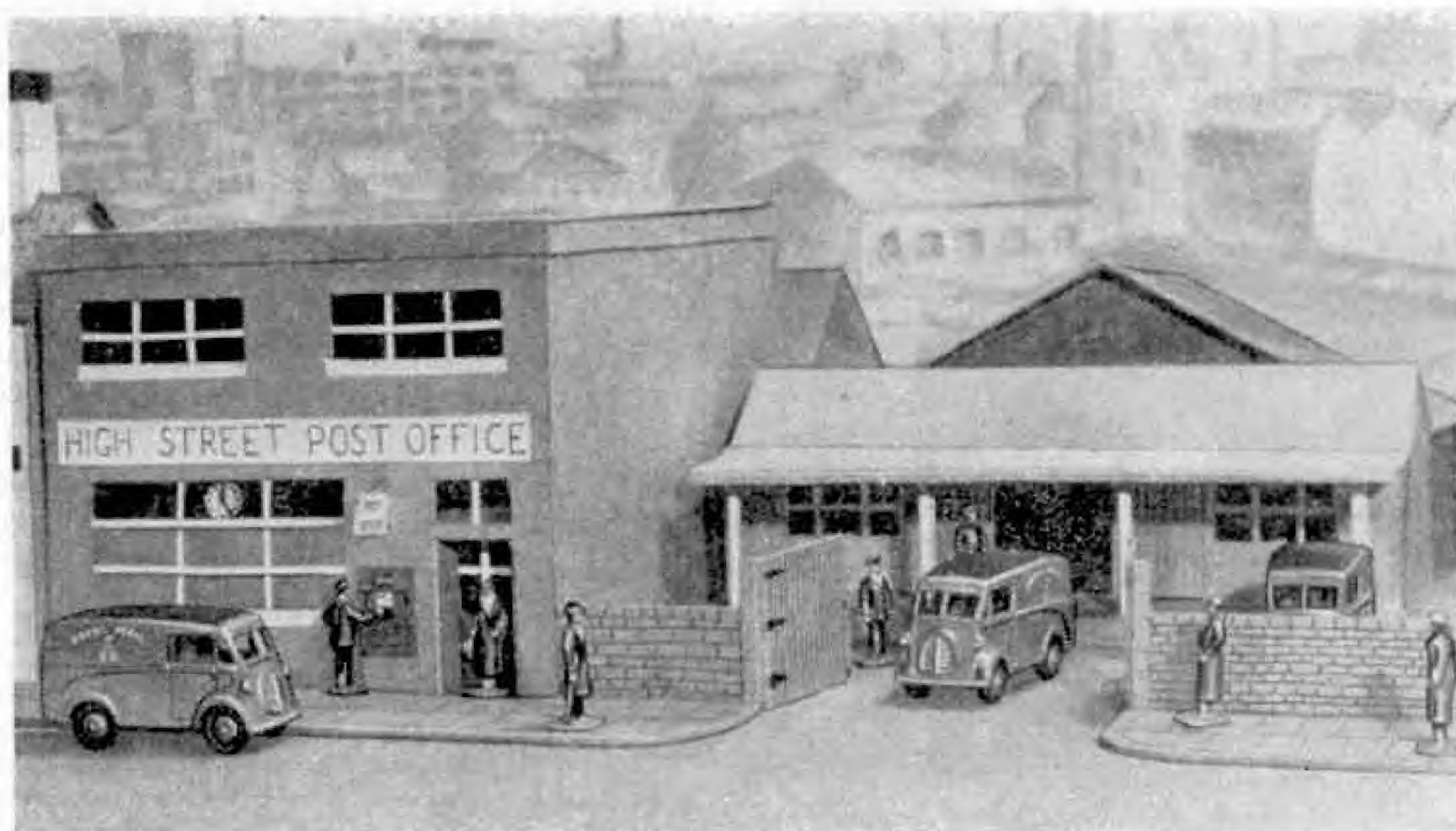


were seriously overworked! Of course this state of affairs could not be tolerated and now a Royal Mail Van (Dinky Toys No. 260) has been added to the range.

The new model is based on one of the latest vehicles and is finished in the familiar Post Office red, with a black roof. The details of the cab and the rear doors are clearly and accurately marked, while the correct transfers along the sides apply the finishing touches and make the model just like the real thing.

You can see the new model in the picture on this page, where it is shown alongside a miniature General Post Office in a small but busy town. The sorting shed alongside the main building has a

loading platform in front, so that the Vans can back right up to this platform to deliver or load their bags of mail without undue lifting.



The new Dinky Toy Royal Mail Van provides plenty of scope for play schemes, as is shown in this scene of activity at a Dinky Toys town Post Office.

Easy Model-Building

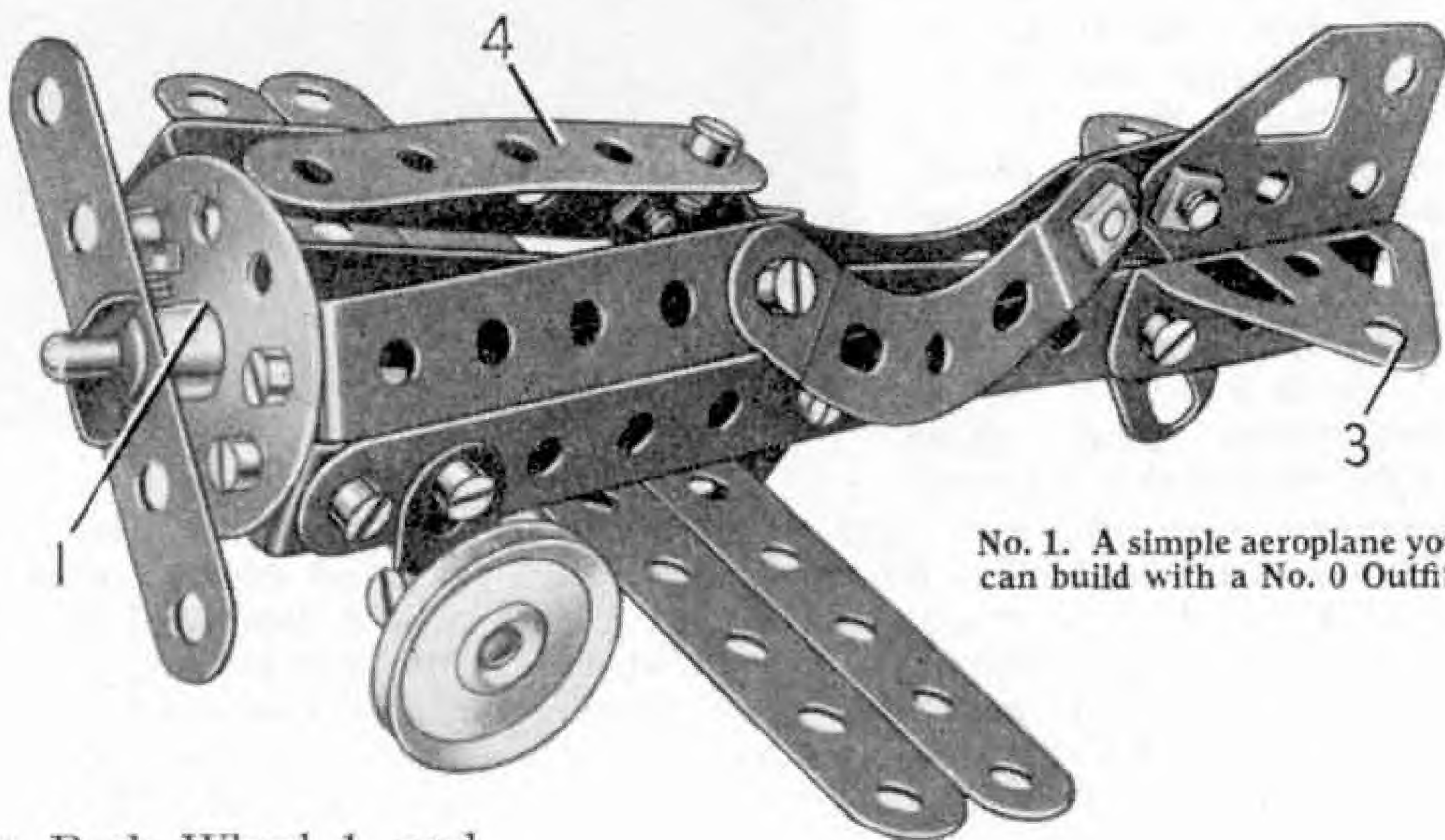
"Spanner's" Special Section for Juniors

A NEW model for Outfit No. 0 and two very useful mechanisms that you can use in many of the models you build, make up the programme I have prepared for you this month.

I am beginning by describing the model. This is the neat little aeroplane shown in pictures Nos. 1 and 2, and you will find all the parts you need to build it in Outfit No. 0.

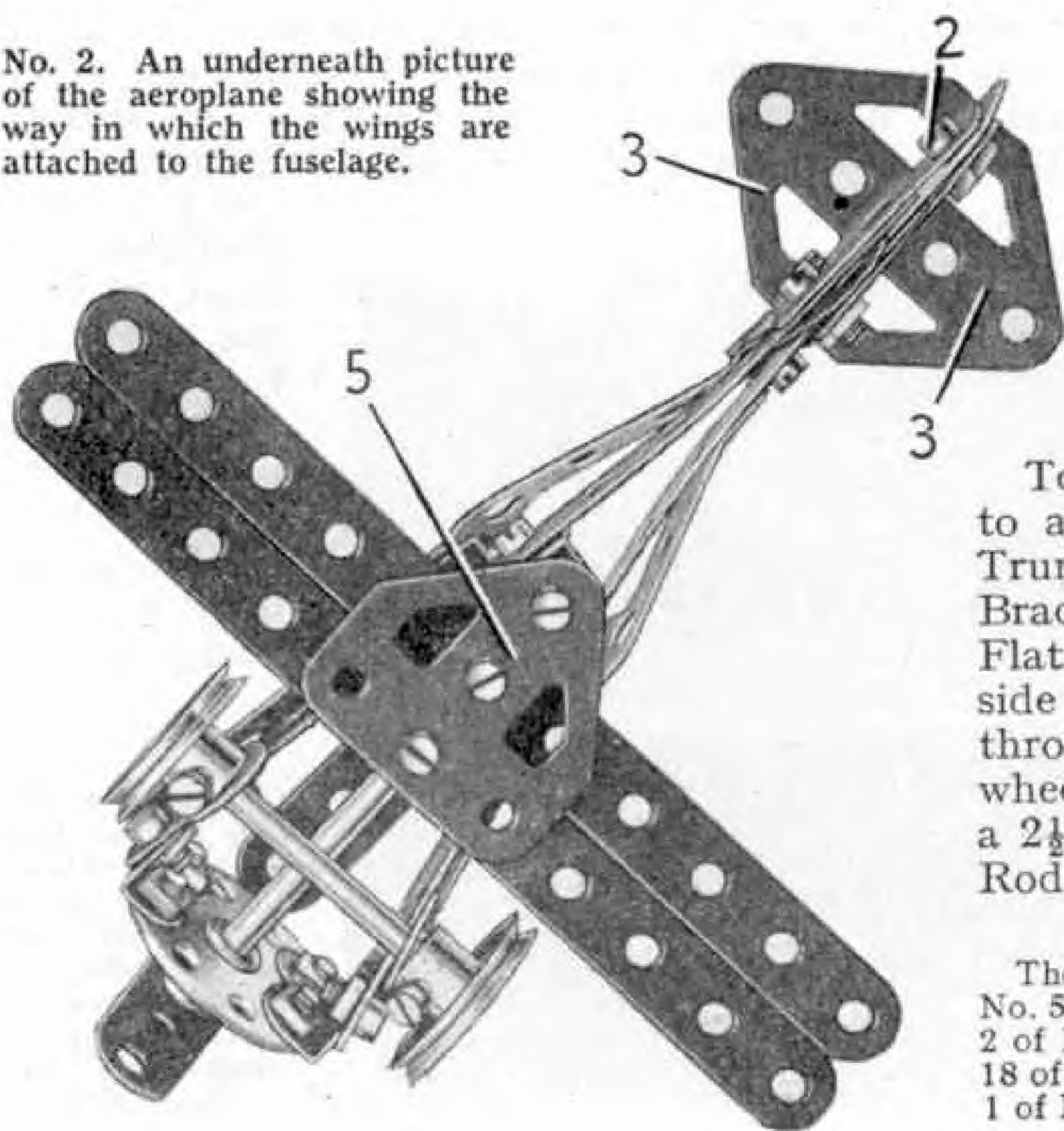
First of all bolt together the parts that form the fuselage or body of the aeroplane. Take two $5\frac{1}{2}$ " Strips and to the front end of each of them fix an Angle Bracket. Bolt the Angle Brackets to a Bush Wheel 1, and join the rear ends of the Strips by a bolt 2, using this bolt also to hold in place a Flat Trunnion. The Flat Trunnion forms the rudder and the tail fin of the

aeroplane. Complete the tail by bolting to each side a Trunnion 3, taking care to use the bolt that fixes the Trunnions in place to attach also a Fishplate. The Fishplate supports the tail when the model is on the ground.



No. 1. A simple aeroplane you can build with a No. 0 Outfit.

No. 2. An underneath picture of the aeroplane showing the way in which the wings are attached to the fuselage.



Bolt two $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strips to the Bush Wheel 1 as shown, and then connect their rear lugs together by another bolt.

Now fix a $2\frac{1}{2}$ " Stepped Curved Strip to each Double Angle Strip and join together the rear ends of the Curved Strips with a Bolt that holds also a Fishplate. Connect the Fishplate to the Flat Trunnion of the tail. Bolt a $2\frac{1}{2}$ " Strip 4 to an Angle Bracket. Fix the Angle Bracket to one of the Double Angle Strips.

To make the wings bolt two $5\frac{1}{2}$ " Strips to a Flat Trunnion 5. Connect the Flat Trunnion to the fuselage by an Angle Bracket fixed at the pointed end of the Flat Trunnion. Fix a Fishplate to each side of the fuselage, and pass a 2" Rod through them. On this Rod fix the landing wheels. Now attach the propeller. This is a $2\frac{1}{2}$ " Strip held by a Spring Clip on a $3\frac{1}{2}$ " Rod. Fix the Rod in the Bush Wheel.

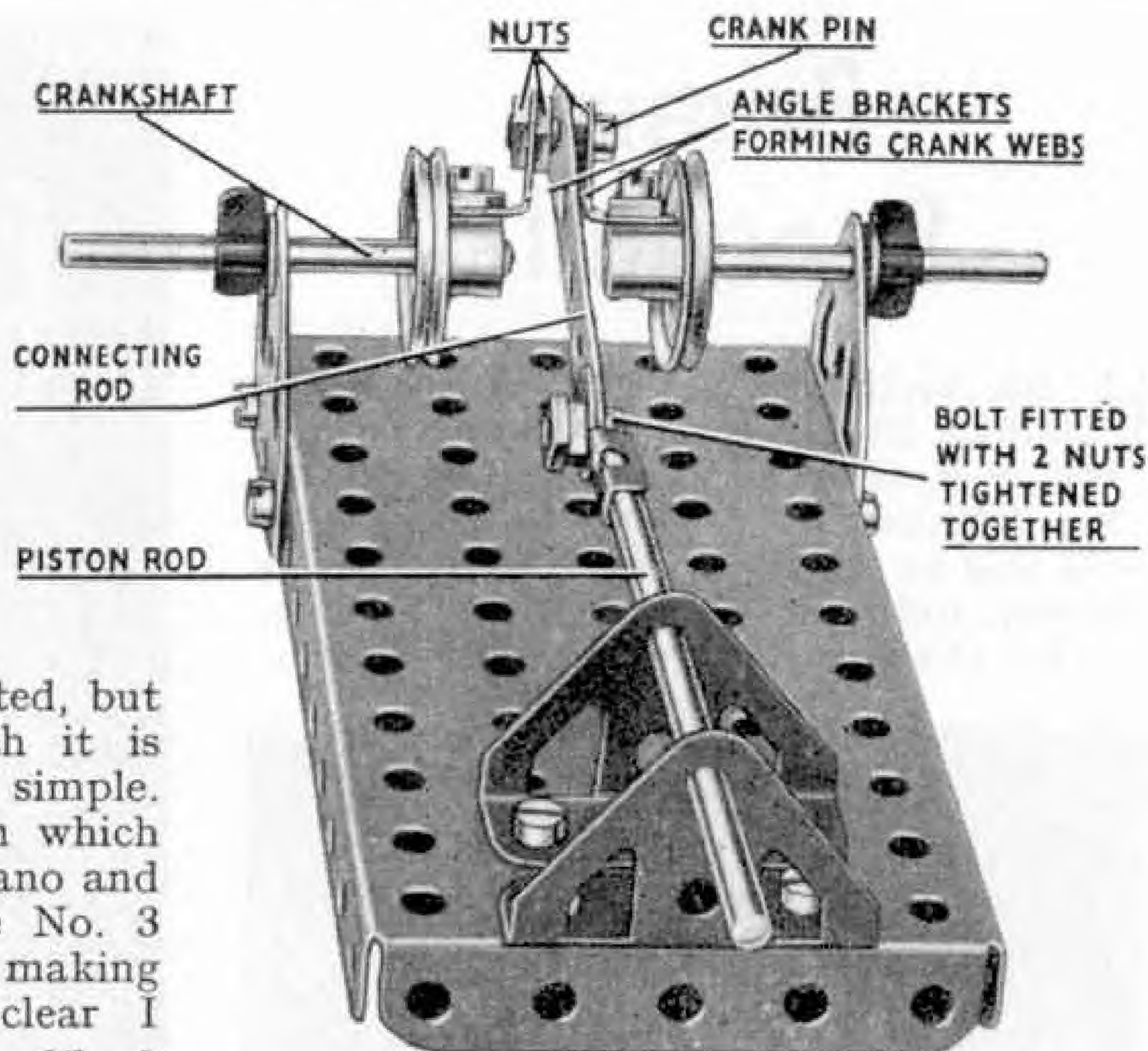
The parts used in this model are 4 of No. 2; 2 of No. 5; 4 of No. 10; 4 of No. 12; 1 of No. 16; 1 of No. 17; 2 of No. 22; 1 of No. 24; 1 of No. 35; 19 of No. 37a; 18 of No. 37b; 2 of No. 38; 2 of No. 48a; 2 of No. 90a; 1 of No. 111c; 2 of No. 126; 2 of No. 126a.

How to Make an Engine Crankshaft

Before you have been model-building very long you are sure to want to build an engine of some kind, and no matter how simple this may be you will need what is known as a crankshaft. This is the part of the engine that changes the to and fro, or up and down movement of the piston into the continuous rotating movement required for the engine driving shaft.

This may sound rather complicated, but actually the crankshaft by which it is done in most engines is very simple. There are many different ways in which a crankshaft can be made in Meccano and one of them is shown in picture No. 3 on this page. For the purpose of making its operation and arrangement clear I have assembled the crankshaft on a Flanged Plate, and fitted simple representations of a connecting rod and a piston rod.

The crankshaft itself is made up as follows. Two short Rods are each fitted with a 1" Pulley with boss at one end. By means of a bolt and a nut, an Angle Bracket is fixed to the boss of each Pulley, and these form what are known in real engineering as the crank webs. The two Angle Brackets are joined together by a crank pin, which in our simple mechanism is a $\frac{1}{2}$ " Bolt. Push the Bolt through one of the Angle Brackets, with the head on the outside, and then tighten a nut against the Angle Bracket so that it is held tightly between the nut and the Bolt head.



No. 3. This simple crankshaft is suitable for engines of many kinds.

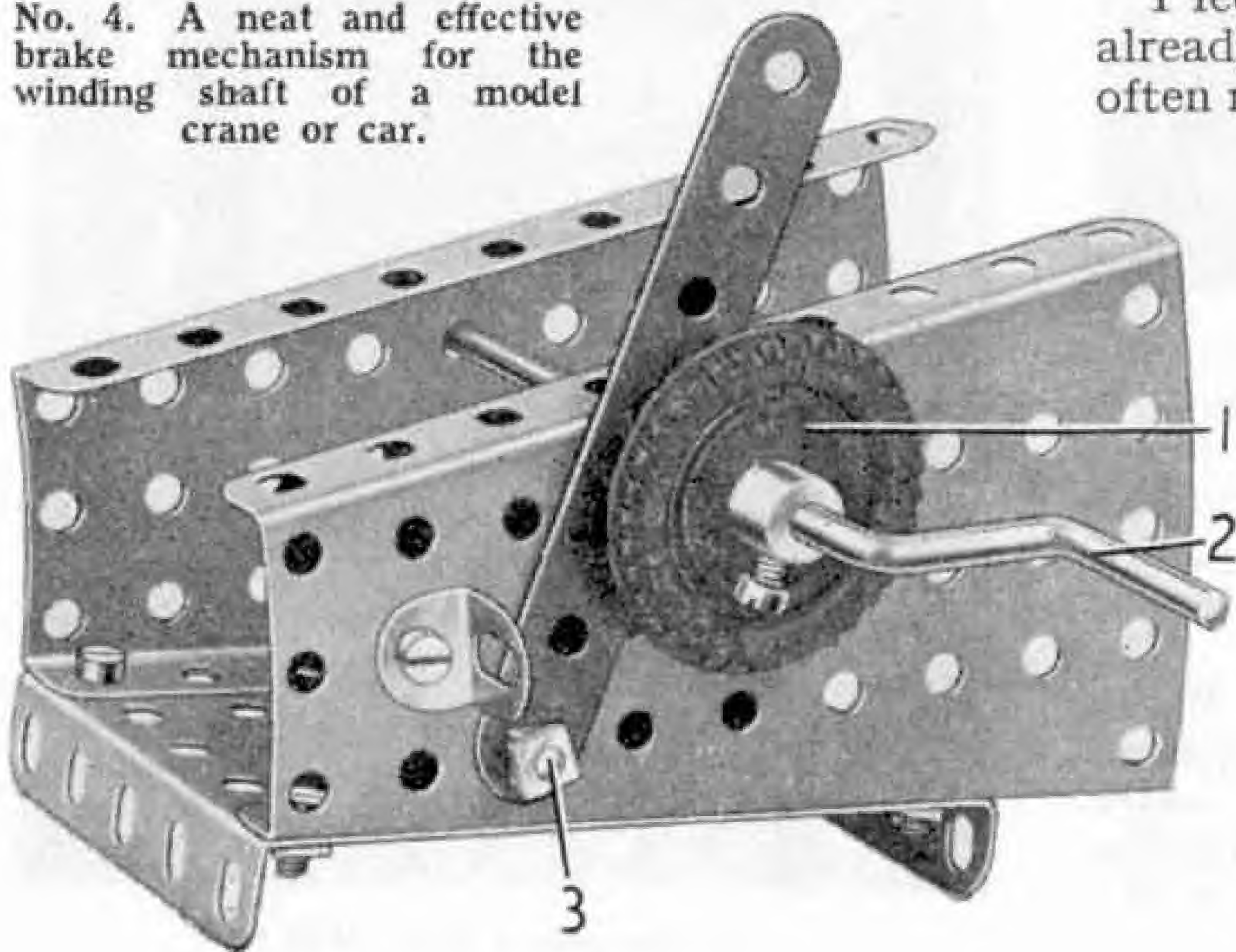
The crank pin is used to link the crankshaft to the connecting rod, which in my assembly is represented by a $2\frac{1}{2}$ " Strip. Place the Strip on the Bolt as shown and then place on the Bolt a nut. Pass the Bolt through the free lug of the second web or Angle Bracket, and finally screw on another nut. Tighten these two nuts against the Angle Bracket. The crankshaft is now complete and if you have done the job correctly you will find the $2\frac{1}{2}$ " Strip hanging freely on the crank pin.

A Brake for your Crane or Car

I feel sure that you will have discovered already that one of the mechanisms most often required in a model is a brake of some kind, and in picture No. 4 you can see one simple brake that you can use in models of cranes and cars.

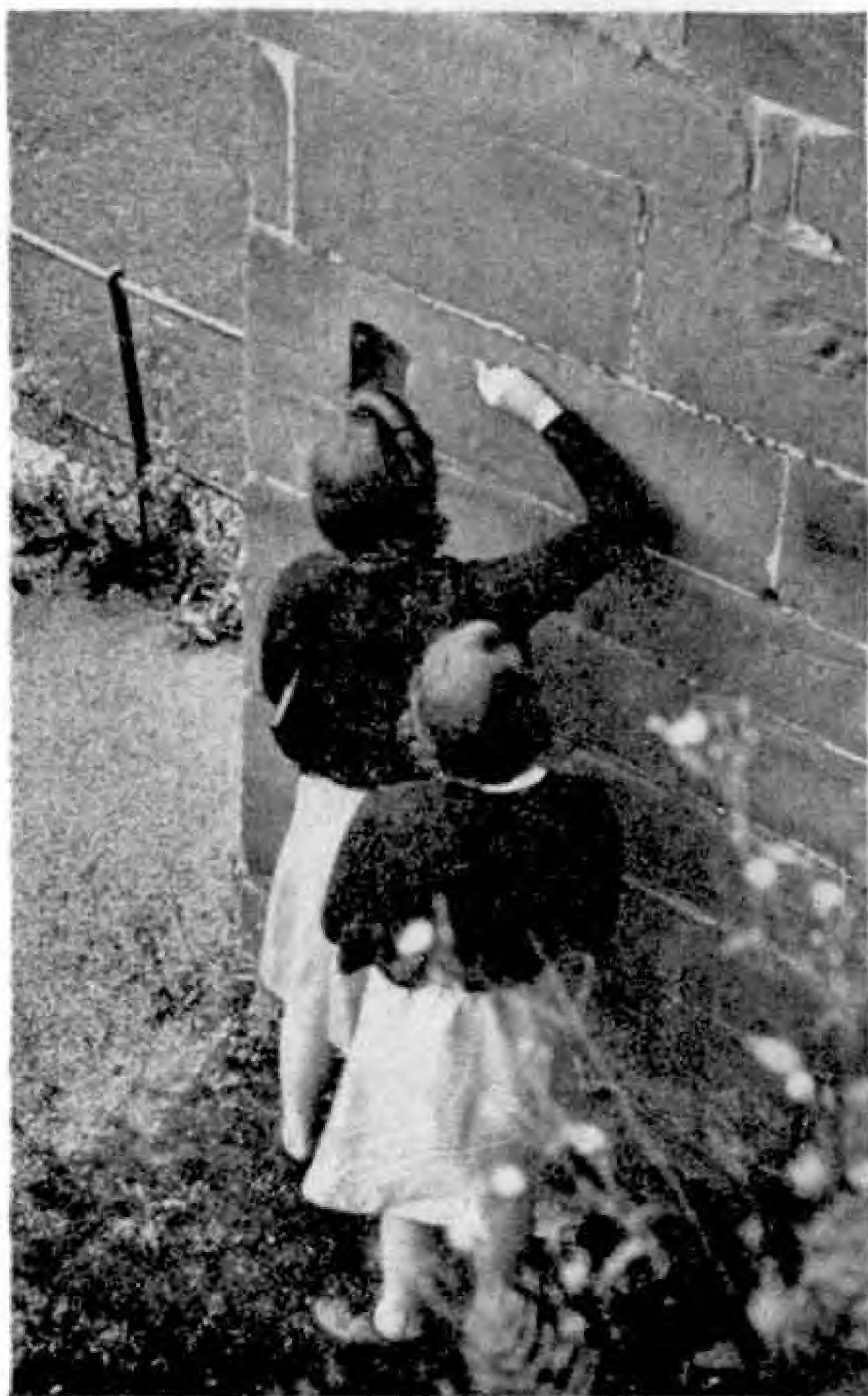
To make this, fit a 1" Pulley 1 with a Motor Tyre, and fix it directly on to the Rod that you want to control. In my model this Rod is marked 2. Lock-nut a Strip on a Bolt 3 fixed at a suitable point on your model, and arrange matters so that by moving the Strip it can be made to press against the inner face of the Tyre. For a car the Pulley should be fixed on one axle, and the Strip linked by Cord to a foot pedal or hand lever.

No. 4. A neat and effective brake mechanism for the winding shaft of a model crane or car.



Britain Beautiful?

IN the picture below two of the worst vandals of our countryside are seen at work in Kenilworth Castle, Warwickshire. They may be pleased to return many years later and to see again the initials they are carving, and they will probably find others, cut by those incited by their example.



Litter is an ancient enemy, and I wonder sometimes if it will *ever* be overcome. I believe the notice in St. James Park, London, reproduced here, has proved effective, and perhaps the notice in verse pictured at the foot of the page too is proving a useful aid to tidiness. The Country Code of the National Parks Commission also warns us to guard against risk of fire, to close gates, keep dogs under control and avoid damage to fences, hedges and walls, and generally to respect the life of the countryside.



I am sure *M.M.* readers need no reminders on any of these points and that by their example they will help to make our rambling in National Parks and elsewhere happier and more satisfying.



Photographs by Reece Winstone

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

Fleetwood Lighthouse

Lighthouses are built on the highest ground available, around the coast, on the rocks close to the shore, or even out at sea, a good distance from the land, like the Bishop Rock lighthouse, which is about 5 miles from St. Mary's, the largest of the Scilly Isles.

In view of this it seems strange therefore to find a lighthouse built in a main street, like the one illustrated. This is at a cross roads in Fleetwood, and is about 100 yards from the sea front. Its now un-used dome only can be seen from passing vessels.

A. HOLT (Manchester).



A lighthouse at a street corner. Now unused, it is to be seen at Fleetwood. Photograph by A. Holt, Manchester.



The station at Norbury, on the Uttoxeter and Buxton line, now closed to passenger traffic. Photograph by D. Watson, Uttoxeter.

The "Axe" comes to the Dove Valley

The railway passenger service between Uttoxeter and Buxton was withdrawn last October, and the last train ran on Saturday, 30th October, as no trains ran on the line on Sundays.

I was able to travel on the final train part of the way, from Ashbourne to Rocester. As the train drew into Ashbourne station, shortly after 7.0 p.m., with five suburban type coaches hauled by ex-L.M.S. 2-6-4 tank locomotive No. 42665, everything was quiet except for the explosion of a few fireworks let off by certain individuals with a sense of the occasion.

After a wait of ten minutes the train drew out of the station, its passage marked by the explosion of fog detonators as the locomotive ran over them. Three minutes later it ran into Clifton station. There was no such reception as that at Ashbourne, but again the departure was accompanied by the sound of the explosion of fog detonators.

Norbury was the next station on the branch to say "good bye" to the train. At exactly 7.39 p.m. it did this with the waving of hands and the usual explosion of fog detonators. Six minutes later No. 42665 drew into Rocester Junction with its five carriages now full of enthusiasts and local people bidding farewell to their service.

D. WATSON (Uttoxeter).

Scotland's Oldest Branch Line

The Dundee—Newtyle Railway Closes Down

By J. F. Riley

ON the morning of Saturday, 8th January 1955, a diminutive 4-4-2 tank engine hauling a solitary coach crept slowly along the single-track line joining Dundee on the river Tay to Newtyle in the vale of Strathmore, some 10 miles inland as the crow flies. At Dronley, high in the Sidlaw Hills, the little train paused for a moment; then, with a puff of steam hanging in the frosty air and a ribbon of smoke uncoiling over the moor, it moved on. Two figures were visible on the footplate, the driver and fireman, and two more in the guard's compartment. The rest of the coach was empty.

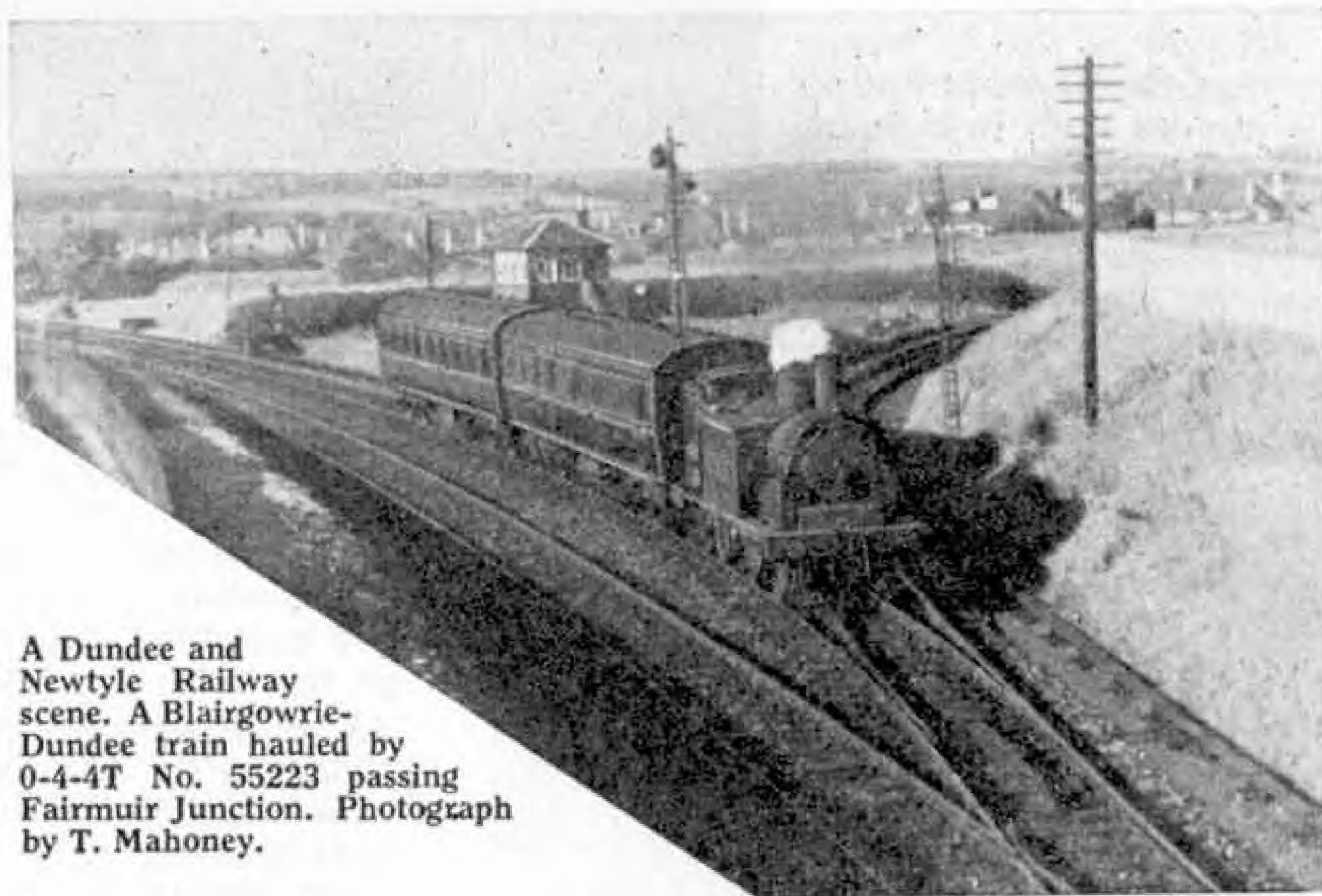
I watched the train as it disappeared in the direction of the snow-clad hills and hoped that the wintry sunshine had proved sufficient for me to obtain a photograph, for this was the last time an 11.59 would call at Dronley. Henceforth the Dundee-Newtyle

branch line, the oldest railway line in the north of Scotland, would be closed to passenger traffic and another chapter of railroad history would have come to an end.

The first report on the projected line appeared in 1825, and the writer remarked that "the chief difficulty in the communication between Dundee and Strathmore arises from the Sidlaw Hills, which cannot anywhere be crossed but at a very considerable elevation." Yet the fact that three turnpike roads did cross the hills at between 500 and 800 feet above sea level led him to infer that a railway there would stand a fair chance of success.

We must remember that at the time the steam locomotive was hardly born, and by

"railway" was meant merely a tramway for vehicles running on flanged wheels. According to the original plan, the wagons and coaches were to be hauled by cable from Dundee to a tunnel in the Law Hill, behind the city, and thence drawn by horses along the comparatively level ground to the foot of the Sidlaws. There a second inclined plane would be used to drag the wagons to the summit whence, after a further section of horse-drawn



A Dundee and Newtyle Railway scene. A Blairgowrie-Dundee train hauled by 0-4-4T No. 55223 passing Fairmuir Junction. Photograph by T. Mahoney.

traffic, a third inclined plane would lower them to their destination at Newtyle.

Constructional work was begun in 1827, and it soon became clear that the estimated cost of £25,600 was woefully inadequate. This placed the company at a disadvantage from the start. Moreover, as one writer remarks, it was in many ways a line that "began and ended nowhere." At Dundee the Ward Road station for the Law Hill incline lay at some distance from the docks; and Newtyle was then barely a hamlet. In due course these omissions and deficiencies were made good. An extension was built to the harbour at the Dundee end; and later the line was continued northwards from Newtyle to the thriving market town of Blairgowrie, and so crossed what was destined to become

4-4-2T No. 7499 at
Dronley.

the main Caledonian line northward from Perth to Aberdeen, with which later it fused.

The success of the Rainhill trials made the shareholders consider seriously whether fixed winding engines and horse-drawn wagons were all that a railway should have. So in 1833 two small 0-2-4 locomotives with vertical cylinders were purchased locally, to be followed in due course by two more, one of which was built by Robert Stephenson. Thereafter the history of the Dundee Newtyle Railway is concerned largely with the means of dispensing with those awkward winding engines and of circumventing the steep slopes on which they operated.

In 1860 the Balbeuchly incline up the Sidlaws was by-passed and Dronley station appeared on the map. In the following year a great hairpin loop line was made to the west of Dundee to outflank the Law Hill itself. So close together were the two arms of this loop that it was possible to miss your train in one part of Dundee, and by hurrying to catch it at another. Finally, in 1866, by which time the "Caley" had taken over, the third and last inclined plane, the steep Hatton bank leading down into Strathmore, was made obsolete

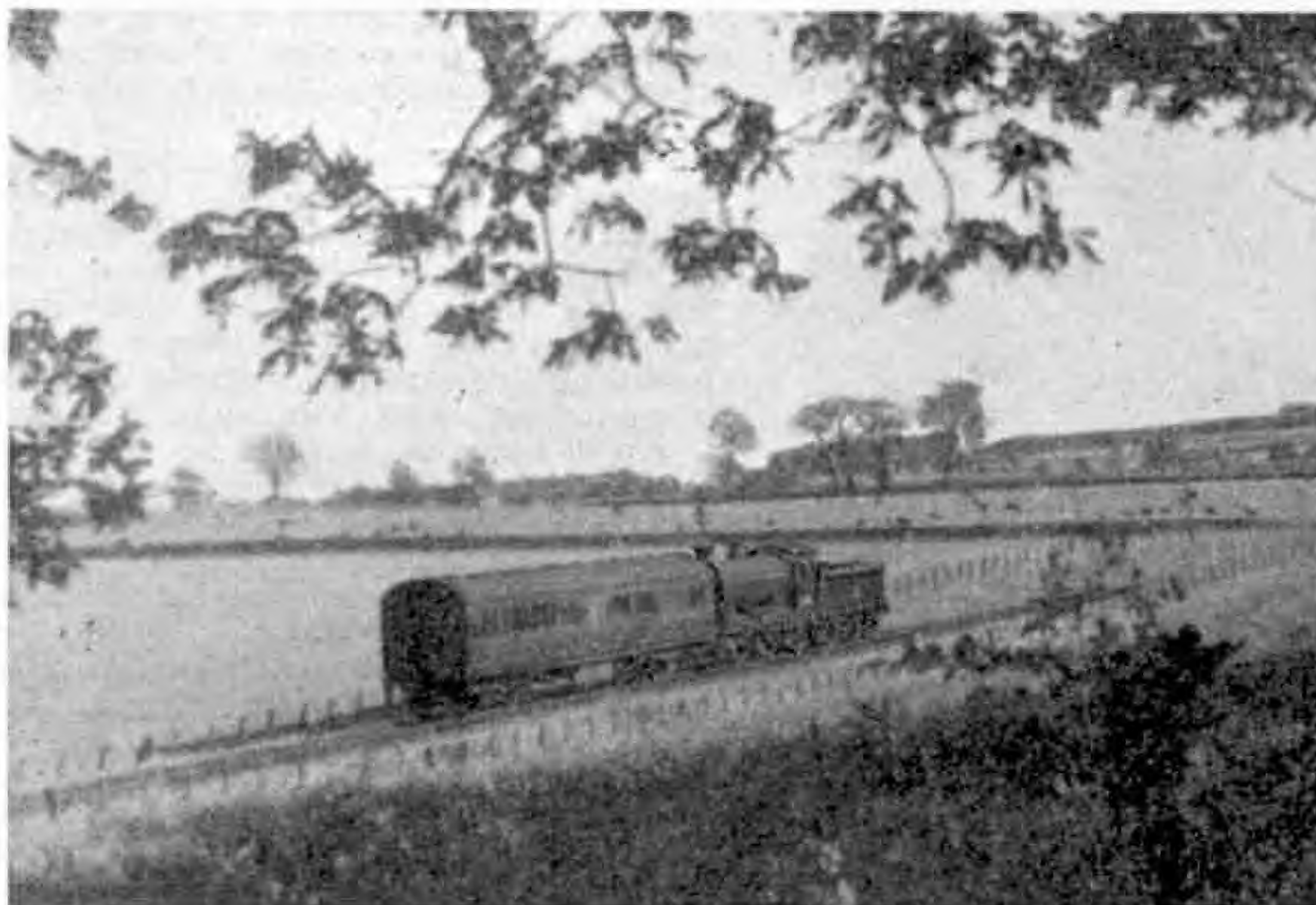
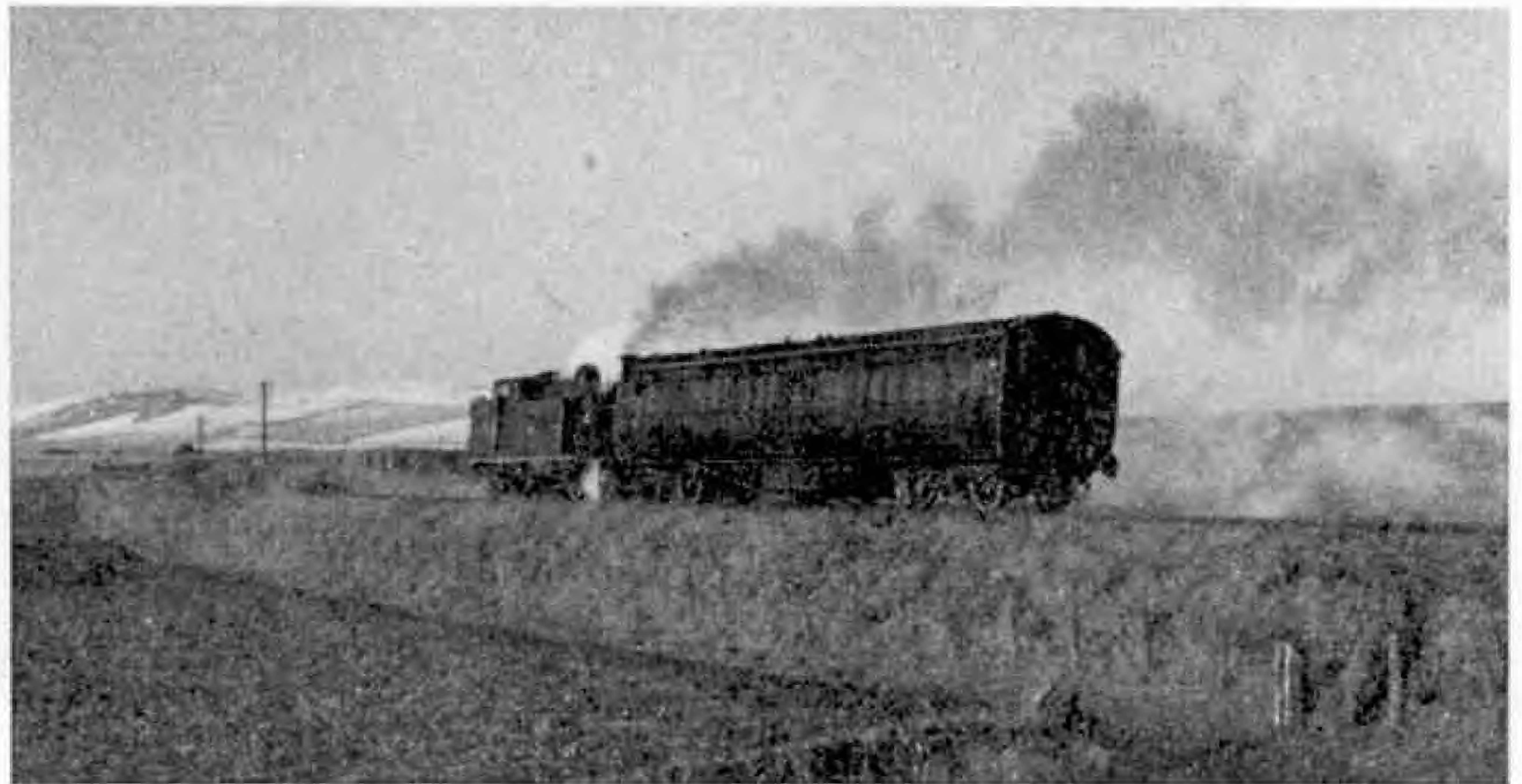
by a further deviation of the line. The locomotives were thus able to work over the entire route.

It is doubtful whether this ancient line ever paid its way. Its busiest days were in the early years of this century, when hordes of fruit pickers went out from Dundee in Summer to the farms in Strathmore. Occasionally on a Saturday in Winter the train would be crowded with football fans on their way to see a match in Dundee, and during the first World War troops were carried on the line to their camp at Blairgowrie. For the most part the carriages were but sparsely filled, however, and of the few passengers some held "feuars tickets", which allowed them to travel free to Perth, Forfar or Dundee. In 1923 the L.M.S. took over and the feuars tickets, held by certain property holders in Blairgowrie, were withdrawn.

And so we come to January 1955 and to the scene that I have described at the beginning of this article. Even when the

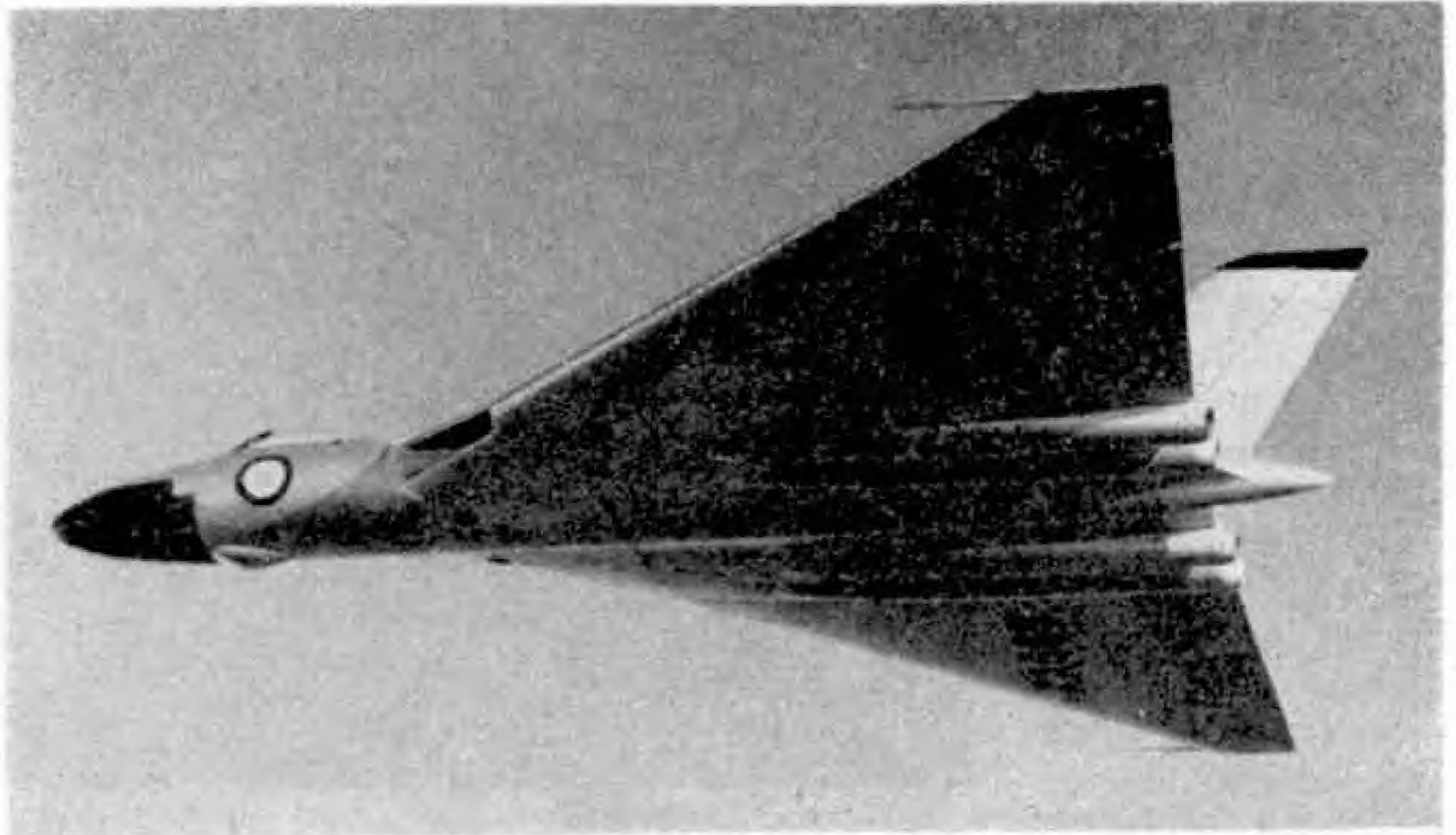
last train left Newtyle at 6.58 p.m. that evening for Dundee (West Station) there was no more than a handful of railway enthusiasts to see it off. Two old "regulars" from Blairgowrie had donned their funeral clothes. A fusillade of detonators accompanied the train, and at Fairmuir the signalman, who had hoisted a lighted brazier on a pole, was greeted by the engine driver with a melancholy farewell blast on the whistle.

An L.N.E.R. 0-6-0 with one coach near Dronley station. Photograph by T. Mahoney.



Air News

By
John W. R. Taylor



First Production Vulcan

The photograph above of XA889, the first production Avro Vulcan, is proof that Britain's force of mighty "V"-bombers is beginning to take shape. Fastest and highest-flying big bomber in the world, the delta-wing Vulcan is able to carry an immense weight of atomic or H.E. bombs for great distances. It is powered by four Bristol Olympus turbojets, the latest version of which develops 11,000 lb. of thrust.

The new Vulcan—the third to fly—is almost identical with the prototypes, except for the dark panel under its nose, which is almost certainly a plastic fairing over the bomb-aiming and navigational radar equipment. The top of the fin also appears to be made of plastic and probably incorporates flush aerials.

T.W.A.'s Baby Brother

Trans-World Airlines have a namesake in Korea, where the transport flight of the U.S. First Marine Aircraft Wing has been christened "T.W.A.," meaning Teeny Weeny Airlines! Equipped with 11 Douglas transports, three jet fighters and two converted torpedo 'planes, the military T.W.A. is a legitimate airline, with schedules, passengers and cargo, serving bases all over South Korea. It even has flagships, for as soon as they have landed the pilots invariably

This striking view of XA889, the first production Avro Vulcan, was photographed during a recent test flight.

open their window and hoist a small flag bearing the First Marine Aircraft Wing insignia. All the "airline" lacked were stewardesses; and the real T.W.A. has now repaired this deficiency by sending to Korea some life-size cardboard stewardesses, together with a supply of the famous red T.W.A. overnight bags.

Gold-Plated Windscreens

Latest idea to improve de-icing is to fit gold-plated windscreens. Developed by the Triplex Company, they are made of normal laminated safety glass, with a gold film less than one-millionth of an inch thick between the two outer layers of the lamination. Windscreens with the new gold-film conductor require a lower voltage for de-icing than any other known material.

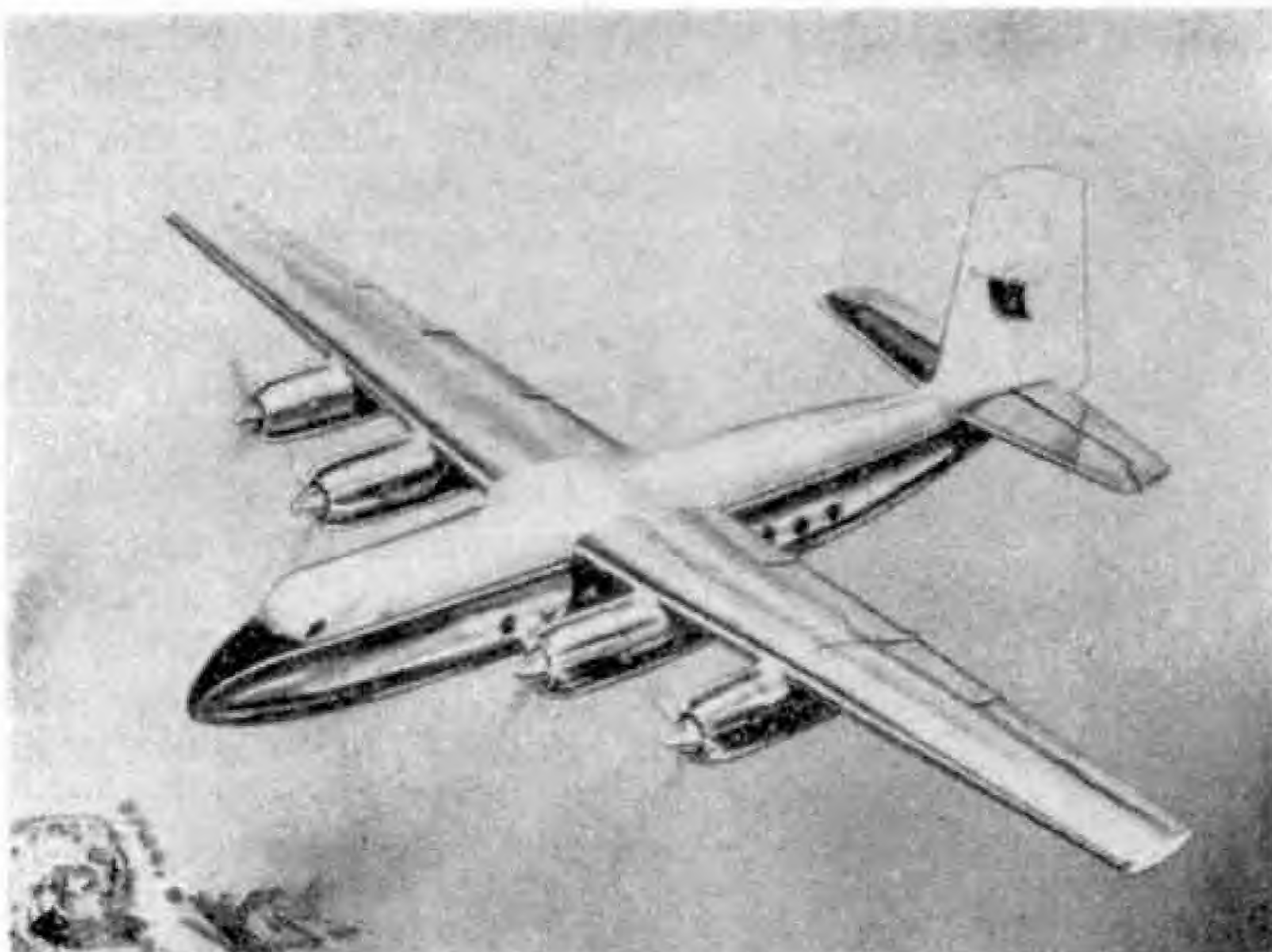
Introducing the Herald

An air liner of which we are likely to hear a lot in the next few years is the Handley Page Herald, an artist's impression of which is given on this page.

Looking rather like a high-wing Viscount with piston engines and a big squarish fin and rudder, it has accommodation for up to 44 passengers, or 4½ tons of freight, or combinations of both; and is designed for economical operation in areas where immense concrete runways may not be available.

It is an ideal Dakota replacement for countries like Australia, and two Australian airlines have, in fact, already placed orders for Heralds before the prototype has flown. No individual quantities have been announced; but Queensland Airlines are believed to have ordered three, and Australian National Airways' order is quoted as "a large number." A contract from Lloyd Aero Colombiano has now brought total orders to 29 aircraft.

The Herald will be powered by four 870 h.p. Leonides Major engines, and will have a range of 1,000 miles at over 200 m.p.h. with 3½ tons of payload. Wing span will be 95 ft. and loaded weight 34,000 lb. The prototype is due to fly this summer. Meanwhile, two Leonides Major engines are being flight tested on a modified H.P. Marathon.



Artist's impression of the Handley Page Herald, which can carry up to 44 passengers or nearly five tons of freight.



D.H. (Canada) Otter light transport in U.S. Army colours—Arctic red and white camouflage. Photograph by courtesy of de Havilland Aircraft of Canada Ltd.

Otters for U.S. Army

The British-American trade is by no means all one way, for de Havilland Aircraft of Canada Ltd. have been awarded an initial order for 84 Otter light transports for the U.S. Army, in the face of stiff competition from American companies. The choice was, no doubt, influenced by experience with the smaller de Havilland Beaver, several hundred of which are serving with the U.S. Army throughout the world.

The Otter, illustrated above, is a rugged 9-14 passenger aircraft, powered by a 600 h.p. Pratt and Whitney R1340 engine, and has been in production for two years. Substantial numbers have been built for the R.C.A.F., the Royal Norwegian Air Force and civilian operators in Canada, Norway, Colombia and the Philippines.

The U.S. Army's first six Otters have been delivered to the Corps of Engineers as supply aircraft on survey operations in Alaska and the Caribbean area. The others will go to Transportation Corps Troop Companies, which specialise in operations from improvised airstrips in combat areas, carrying cargo, troops and paratroops, and evacuating casualties.

B.O.A.C.'s New Fleet

Details have now been given of the fleets of British-built aircraft that will go into service with B.O.A.C. in the next three years. They will include 33 Bristol Britannia turboprop air liners and 20 de Havilland Comet jet liners.

Delivery of the 15 Britannia Series 100 aircraft will begin this year. They will be 62-93 seaters, powered by four 3,780 e.h.p. Proteus 705 engines, and will be used on the Corporation's medium-range routes. Next will come 10 Series 300 Britannias, with 4,150 e.h.p. Proteus 755 engines and accommodation for 65-101 passengers; followed by eight long-range Britannia 300LR's, which are similar to the Series 300 but with an extra 1,500 gall. of fuel, which should enable them to fly non-stop London-New York services throughout the year. In addition, two of the ordinary Series 300 aircraft will eventually be converted to LR standard, making a fleet of 10 of the long-range type.

B.O.A.C. have also ordered 60 of the revolutionary

new Bristol BE.25 supercharged turboprops, and will re-engine some of the Series 300 Britannias with these in due course, to improve their performance still further.

B.O.A.C.'s Comets will be of the new Avon-powered Series 4 version; and when they enter service in 1958 they will be the most thoroughly tested air liners in the world.

To tide them over until the Comets and long-range Britannias are ready, B.O.A.C. have been allowed to order 10 Douglas DC-7C air liners from America at a cost of about £13 million. Although piston-engined, these fine aircraft can carry 62-95 passengers for 4,400 miles at 320 m.p.h., and will enable the Corporation to meet the challenge of its competitors on the all-important North Atlantic route.

Convair's Big Boat

The Convair R3Y-1 Tradewind, fastest water-based transport in the world, has flown non-stop across



Convair R3Y-2 military transport flying boat, with its bow-loading doors open while a howitzer descends the ramp and rolls ashore. Photograph by courtesy of Convair.

America, from San Diego, California, to Patuxent Naval Air Station in Maryland. Time for the 2,400-mile trip was about six hours, giving an average speed of 403 m.p.h.

The 80-ton R3Y-1 was the first of a series of these aircraft being built for the U.S. Navy, and a sister-ship to the R3Y-2 illustrated on this page. Both are powered by four 5,500 h.p. Allison T-40 turboprops and are capable of lifting 21-ton payloads more than 2,000 miles. Only the R3Y-2 has bow-loading doors.

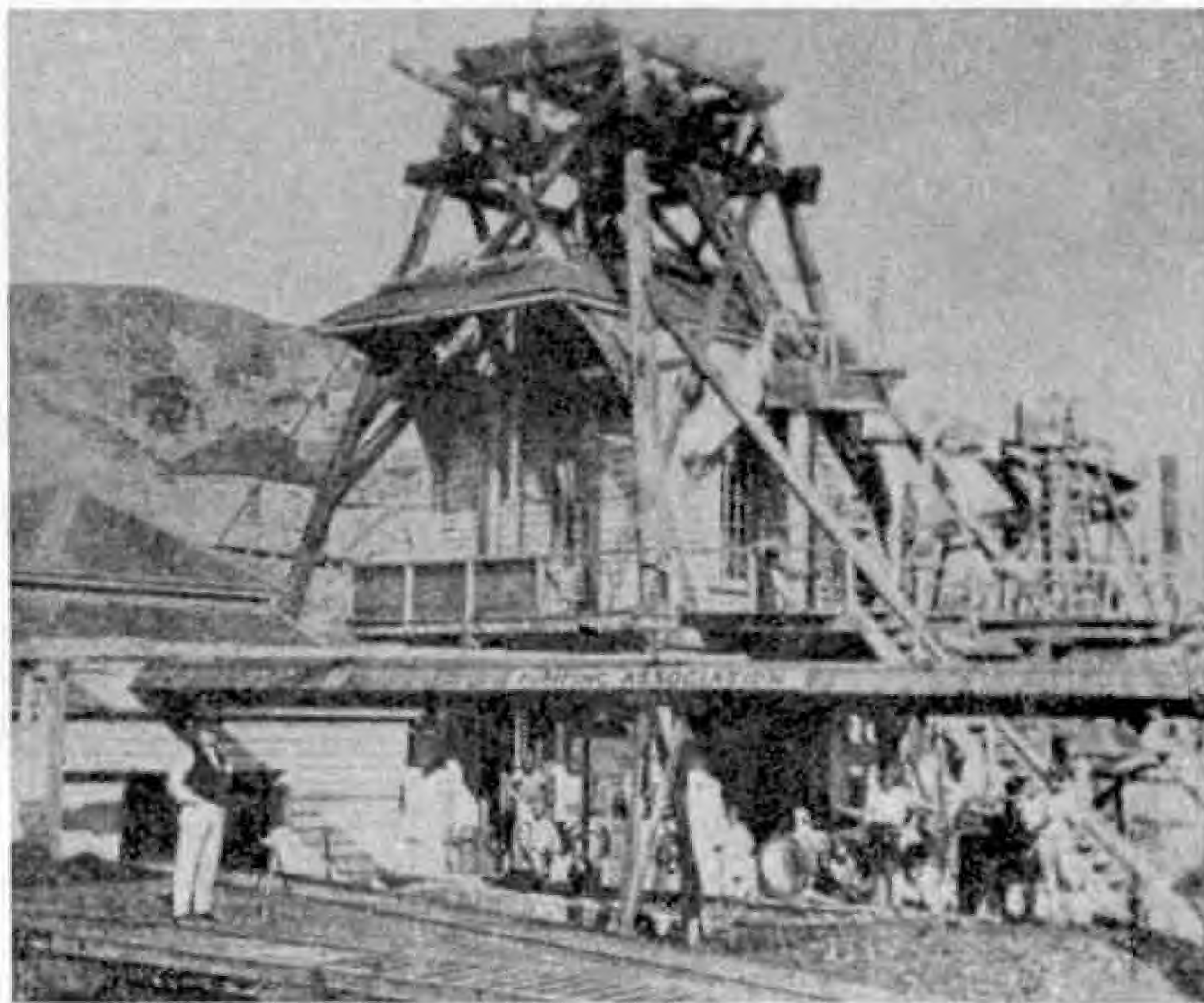
Gold in the Hills

The Story of a New Zealand Boom Town

By Barbara Neville

THAMES, in the North Island of New Zealand, is just a small town, not unlike other small towns in other parts of the world. But once it was more important than Auckland, now the largest city in the Dominion. In fact Thames was truly a golden town.

Gold was first discovered in New Zealand at Coromandel, thirty-five miles north of Thames, in 1852. The district has recently celebrated its centenary with a dramatic pageant of the olden days. But the richest gold fields were in Thames. Thousands of people flocked to the district when gold was first discovered there, and Thames was proclaimed a goldfield in 1867. Within three years there was a population estimated at 20,000. The hundreds of bell-tents hastily erected when the rush began were soon replaced by wooden buildings. Some were worthy of the name of houses, others were just shacks, but even to-day there are some of these early wooden cottages still standing. Some have been kept painted and well maintained; others look just as they did in the early days.



The Big Pump, a scene in the Thames gold mining area of the North Island of New Zealand last century.

Gold came from quartz in the hills behind the town, and every little valley had its quota of mines. Little settlements soon sprang up wherever the gold was found. The thump, thump of the stampers crushing quartz were the voices of a hundred mines pounding out their gold. Day and night all around Thames was this thud, thudding noise. Gold was literally being produced by the ton and the world was startled by the discovery.

The Maoris had found gold earlier, but prevented the white man from exploring and it wasn't until 1867 that this reluctance of the Maoris to allow mining was in any degree overcome. An agreement was made with several chiefs to mine certain areas. But

men were looking for alluvial gold, and it wasn't until Hunt found a rich auriferous reef under a small waterfall that miners realised they should be searching for reefs. Discoveries came quickly after that, until the greatest bonanza of the field came from the Caledonian mine, which produced wealth making Thames world famous.



This is a gold mine. It is a claim in the Thames goldfield, named after Hunt, the pioneer who discovered a gold reef under a waterfall.

This discovery was said to be the richest in the annals of quartz mining. At its peak the Caledonian mine produced 361,581 oz. for the year and paid dividends of £198 10s. 0d. per share.



had dwindled to 4,662. Gold profits had dropped and men were wandering off to other goldfields or adventures anew, leaving the boom town to its own resources. Dark days were upon Thames, but the few who remained kept the town from collapsing altogether. It is these names that are prominent in the business life of the present community.

Today Thames is

The main street of Thames in 1869. Most of the buildings seen were swept away by a great fire in 1872.

But all the mines weren't rich. The gold was in patches, and once away from the bonanza itself, the quartz of the reef, in the language of the old miners, "wouldn't pay for grease for the truck wheels."

Thames then had about 100 hotels where miners would come to drink and chat, play billiards or skittles, and enjoy the warmth of a blazing fire. In fact, the hotels those days supplied the comforts that were lacking in their little shacks. Women were few in the early days, and the men had to look after themselves or eat in one of the cookhouses. But gradually as conditions improved men would send for their families and set up home.

Conditions for women folk must have been very difficult. Gumboots were needed to walk the main street, cooking was for the most part on an open fire and washing conditions the most primitive. But these women had the pioneering stamina and they did an excellent job of caring for their families, and even planted gardens round their little homes.

But those days are gone. By 1891 the population

peaceful once again, but happy, and signs of desolation and depression are scarcely noticeable. And although the population is no longer engaged in mining, new industries have sprung up—clothing and footwear—fishing. And of course there is still the foundry, which is a relic of the olden days, but is still producing engines and other things and is employing many men. Farther out of the town, land once swamp has been brought into use for farming, and so prosperity is coming back to Thames.

Thames, about 80 miles from Auckland, has a great number of assets that other places may well envy. Among these are a very fine climate, excellent beaches, good soil for growing plants, adequate water supply, natural beauty, hills, trees, sea . . . what else could any town have?



The May Queen mine.

A Useful Reversing Mechanism

Designed for Continuous Operation

By "Spanner"

I EXPECT most Meccano enthusiasts are familiar with the colourful display models that are centres of attraction at the premises of many Meccano Dealers. One of the most popular of these is a replica of Blackpool Tower, which is shown in Fig. 2 on this page.

The construction of the Tower itself presents no great difficulty. The main feature of the model is the automatic mechanism that operates the two lifts, which rise and descend alternately, although they are driven by a Motor that runs continually in *one* direction. It is the automatic reversing movement that intrigues most of the model-builders who write to me.

I must first make clear one point, in regard to the motor. Display models have to work continuously day after day for long periods and to meet the heavy strain involved they are fitted with high-voltage motors. The automatic mechanism used is just as suitable for use with an E20R Motor, however, which is the type most model-builders will have available. This should be fitted with three stage reduction gearing, however, as shown in Fig. 1. The bearings for the shafts are provided by bolting $1\frac{1}{2}$ " Corner Brackets 1

to the side-plates of the Motor. The gearing gives a total reduction ratio of 27:1, and the final shaft in the gear train is fitted with a 1" Sprocket 2.

The automatic reversing mechanism that controls the movement of the lifts is shown removed from the model in Fig. 4. The housing consists of two $3\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flanged Plates, connected at their ends by two $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flat Plates. Bolted to one end of the housing are four face-to-face 3" Strips, three clear holes of which project above the Flat Plate. To these Strips is fixed a Crank 3.

The input shaft is a 4" Rod fitted with a 2" Sprocket 4, a $\frac{1}{2}$ " Pinion 5, a Worm 6 and a 1" Gear 7. An intermediate shaft 8, which is free to slide endways in its bearings, is a $4\frac{1}{2}$ " Rod. It carries a $\frac{1}{2}$ " Pinion 9, a Collar and a 1" Gear 10. A $\frac{1}{2}$ " Pinion 11 is free to rotate on a $1\frac{1}{8}$ " Bolt attached to one side of the housing

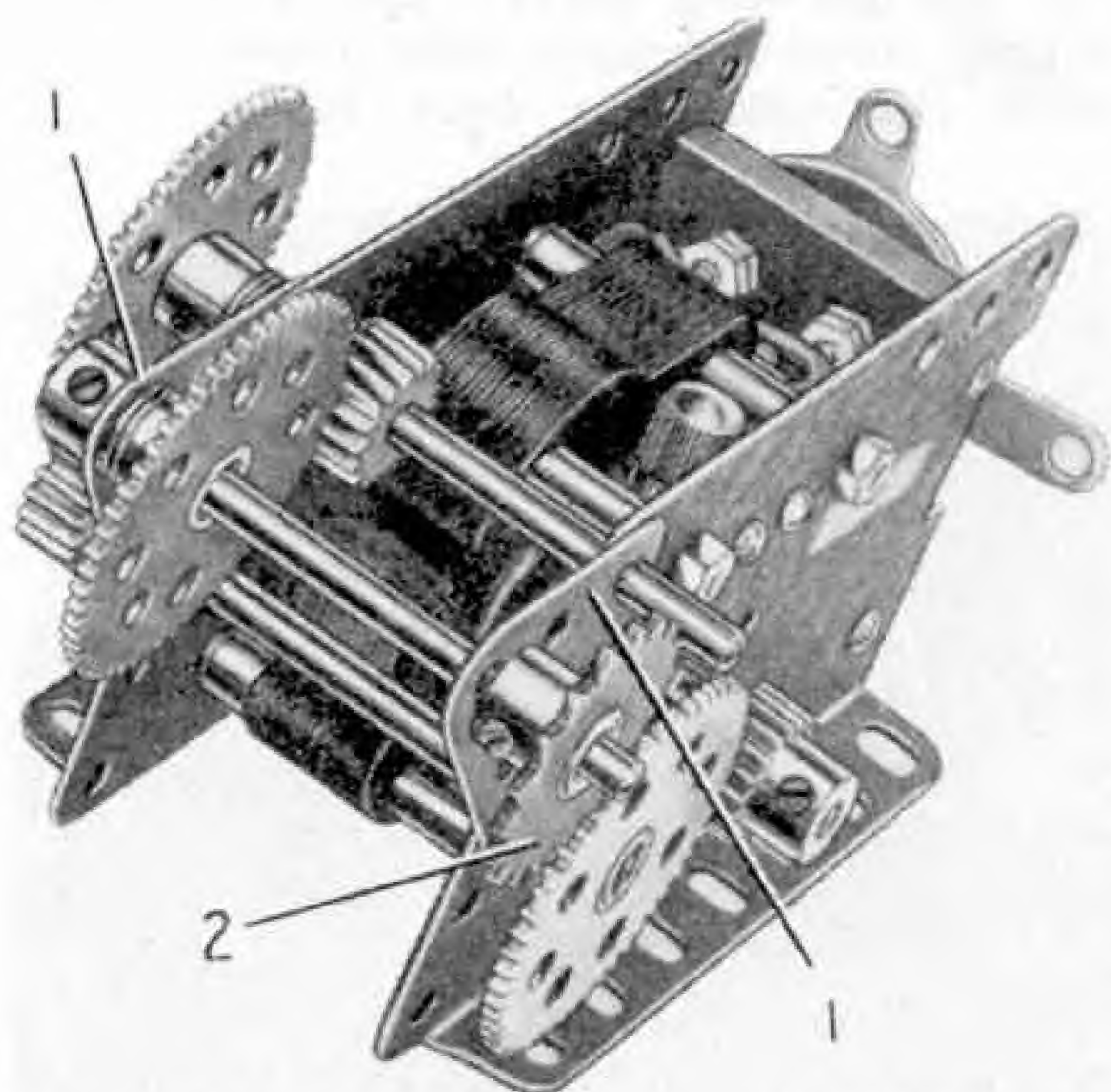


Fig. 1. This view of the power unit of the Tower shows how the speed reduction gearing is fitted to the E20R Electric Motor.

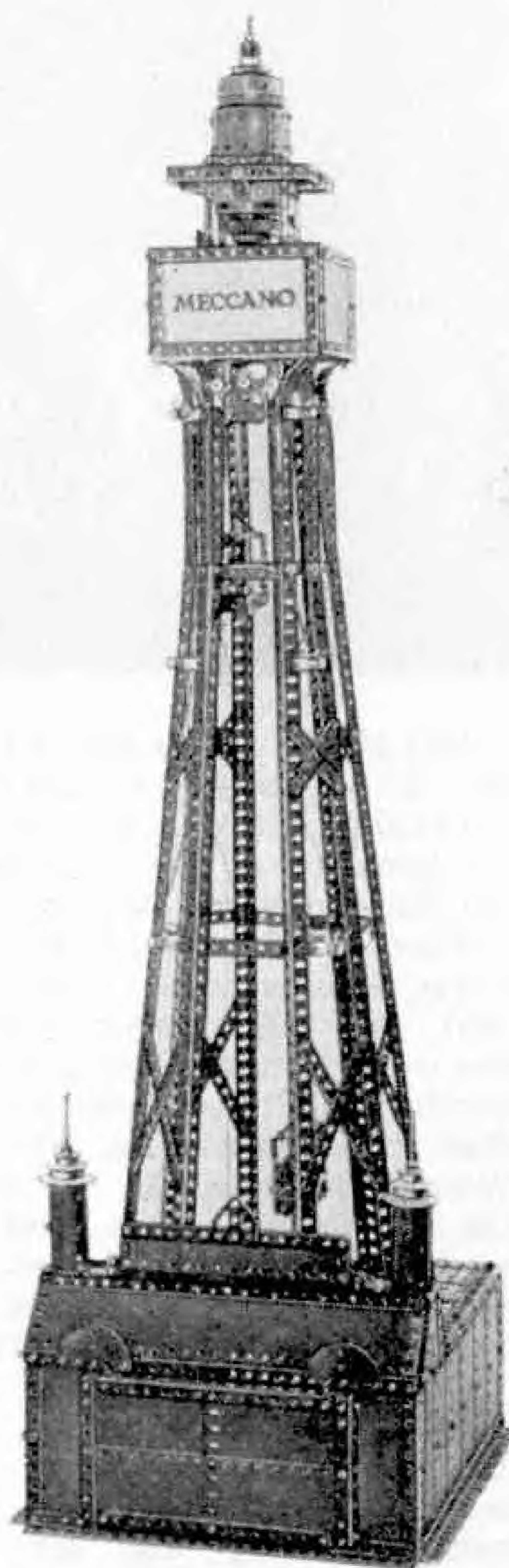


Fig. 2. The lifts in this effective model of Blackpool Tower are operated by the automatic reversing mechanism that forms the subject of this article.

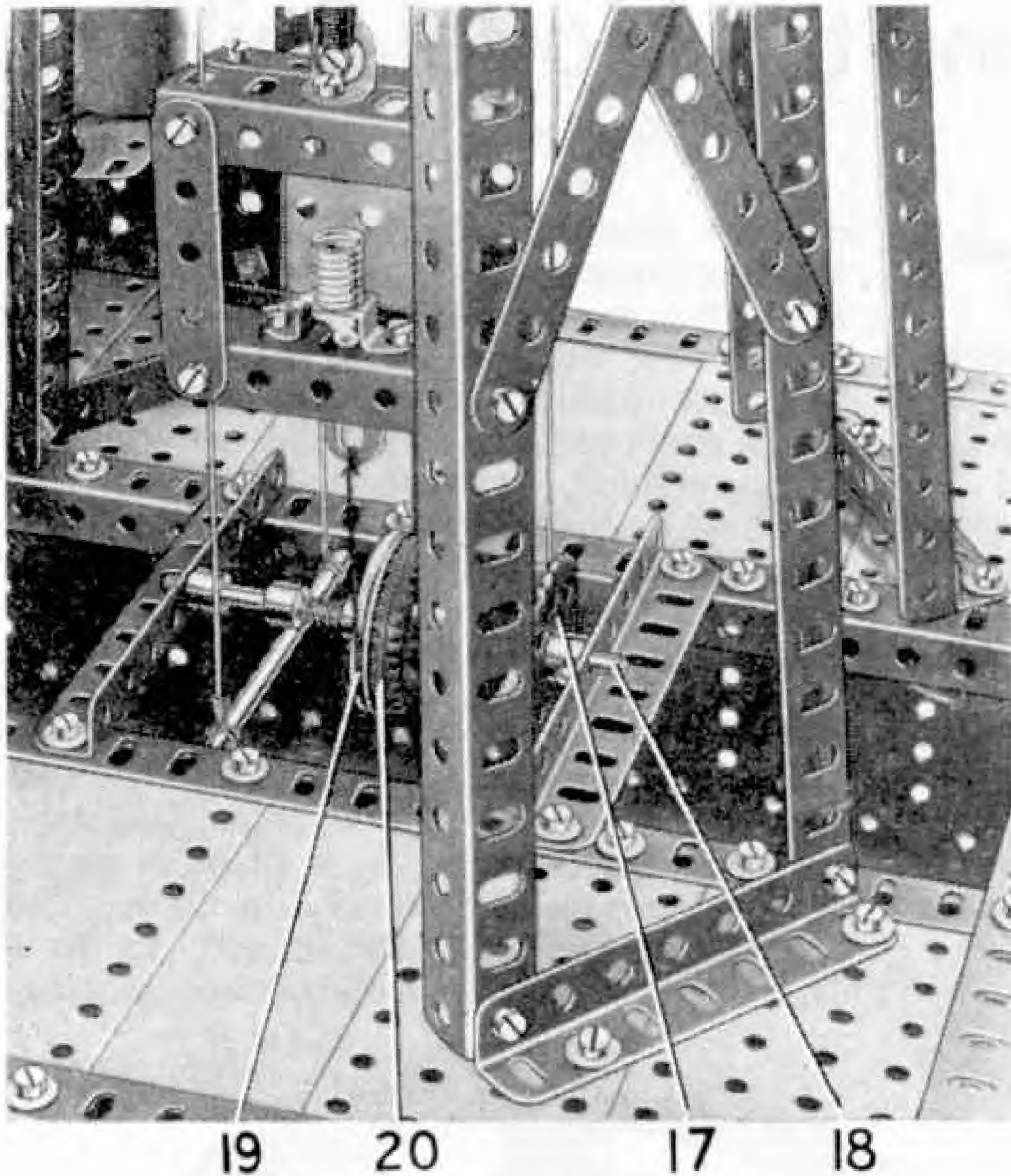


Fig. 3. A close-up of the friction drive arrangement fitted to the lift driving shaft.

movement of Rod 8 is controlled quite simply by a lever 14. This is a $3\frac{1}{2}$ " Strip that pivots between two Collars on a 2" Rod, which is fixed in the Crank 3. A $\frac{3}{8}$ " Bolt 15 held in the Strip by two nuts is arranged so that its head is located between the 1" Gear and the Collar on Rod 8. The side-to-side movement of lever 14 is operated by a 57-tooth Gear that is in constant mesh with the Worm 6. The Gear is fixed on a $1\frac{1}{2}$ " Rod mounted in the end of the housing and in a Double Bent Strip bolted to it, immediately below the 3" Strips that support the Crank 3. A Slide Piece 16 is passed over the end of Strip 14 and is fixed on a $\frac{3}{8}$ " Bolt located in one of the holes in the 57-tooth Gear.

When the Motor unit and the reversing mechanism are completed they are bolted to Angle Girders fixed across the base of the tower. The Sprockets 2 and 4 are connected

by nuts, and the Pinions 5 and 11 are in constant mesh. The drive between the sliding shaft 8 and the output shaft 12 is transmitted by a $\frac{1}{2}$ " diameter, $\frac{3}{4}$ " face Pinion and a 57-tooth Gear, arranged as shown in Fig. 4. A 1" Sprocket 13 is fixed on the output shaft.

It will be seen that when Rod 8 is moved to the left (Fig. 4), the Gears 7 and 10 are brought into mesh and complete the drive to the output shaft. When Rod 8 is moved to the right Gears 7 and 10 disengage, and Pinion 9 is meshed with the Pinion 11. This also completes the drive to the output shaft, but in the opposite direction to that when the 1" Gears are in mesh. Thus by sliding Rod 8 alternately from side to side the direction of the drive is reversed with each movement of the Rod.

The side-to-side

by Chain, and another length of Chain transmits the drive from Sprocket 13 to a 2" Sprocket 17 (Fig. 3). Sprocket 17 is fixed on a Rod 18 supported in the base of the tower, and this Rod is the driving shaft for the (Continued on page 284)

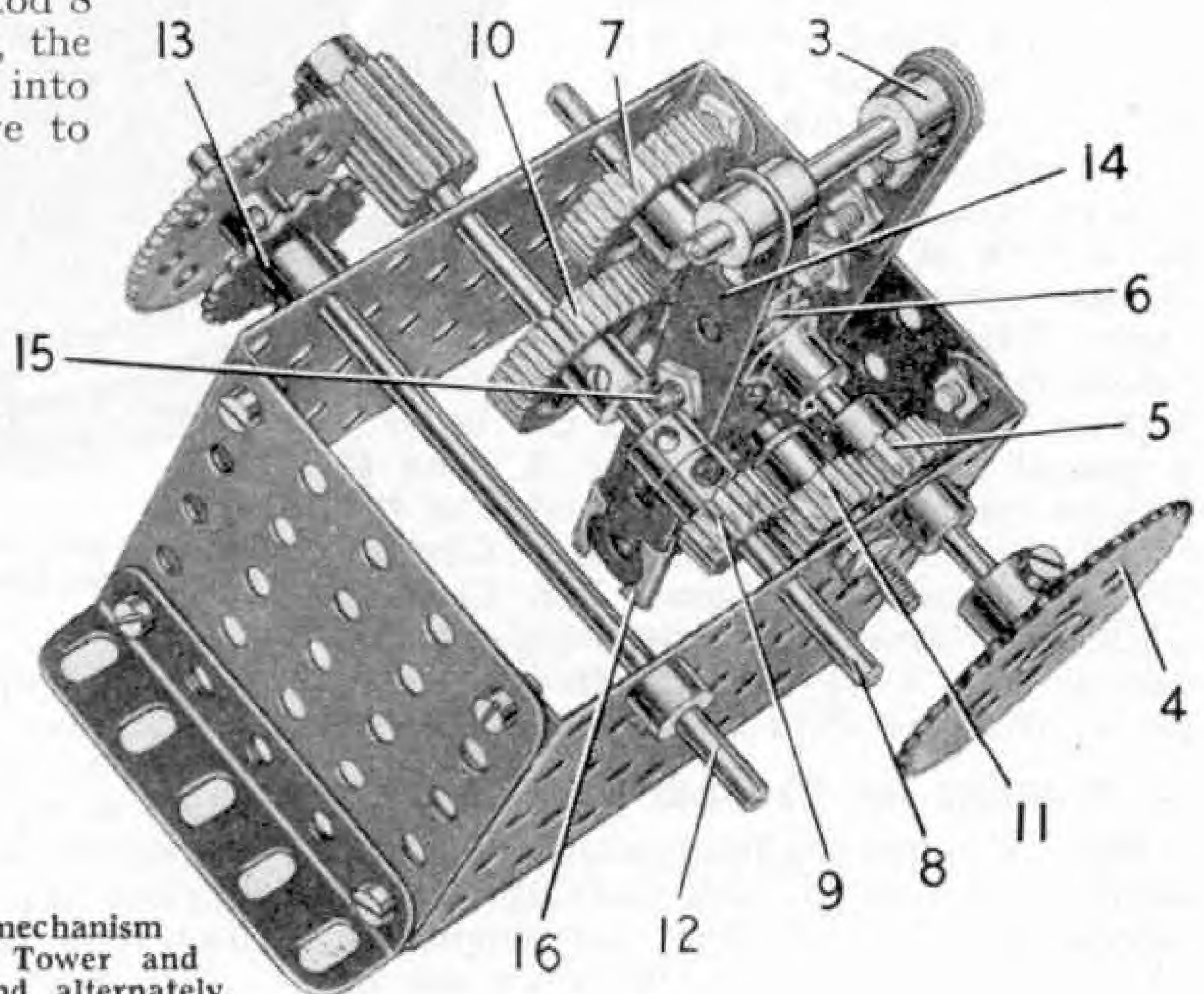


Fig. 4. This automatic reversing mechanism is concealed in the base of the Tower and causes the lifts to rise and descend alternately.



Mr. F. C. Davy, Auckland, New Zealand, is a keen model-builder and was a successful competitor in a recent international model-building competition.

Among the Model-Builders

By "Spanner"

Model Crane Bearing

In my article in the April *M.M.* I included a picture and brief details of a fine crane built by Mr. Nicholson, Mablethorpe. This model was based on an actual crane

operate satisfactorily. If the Gears and Pinions were meshed tightly they would be noisy in operation and would wear rapidly. A certain degree of backlash is therefore desirable in most mechanisms, but in some models where extreme accuracy of movement is essential for efficient working, the slight amount of free movement between the teeth of the parts may be sufficient to affect the accuracy of the machine.

An example of this occurs in the drive to the design table of the Meccanograph. Most model-builders are familiar with this popular model, which enables beautiful patterns to be traced on a sheet of paper clamped on a slowly revolving table. The table turns very slowly indeed, as it is driven through speed-reduction gearing.

used for loading sugar cane on an estate in British Guiana. Shortly after he sent me details of the complete crane Mr. Nicholson visited the Meccano Works and brought with him a roller bearing unit similar to the one used in his model. I was able to take a photograph of the bearing and I am reproducing it as Fig. 1, as I am sure other model-builders will find it useful in the assembly of Meccano cranes.

The lower ring of the bearing is a Circular Girder 1 with a $5\frac{1}{2}$ " Strip bolted across it. A Bush Wheel is attached to the Strip, and a Rod 2 is fixed in the Bush Wheel.

The rollers are eight $\frac{1}{2}$ " loose Pulleys mounted freely on 2" Rods, each of which is held in a Double Bracket by two Spring Clips. The Double Brackets are bolted to a 4" Circular Plate fitted with a Bush Wheel 3, and the latter is passed freely over the Rod 2. The $\frac{1}{2}$ " Pulleys are placed round the edge of the Circular Girder 1 and another Circular Girder 4 rests on them. The Circular Girder 4 forms the upper ring of the bearing and a $5\frac{1}{2}$ " Strip bolted to it is passed over the Rod 2.

Reducing the Backlash in Gearing

Meccano Gears and Pinions are accurately made to ensure smooth running, but a certain amount of free movement or backlash is necessary if the Gears are to

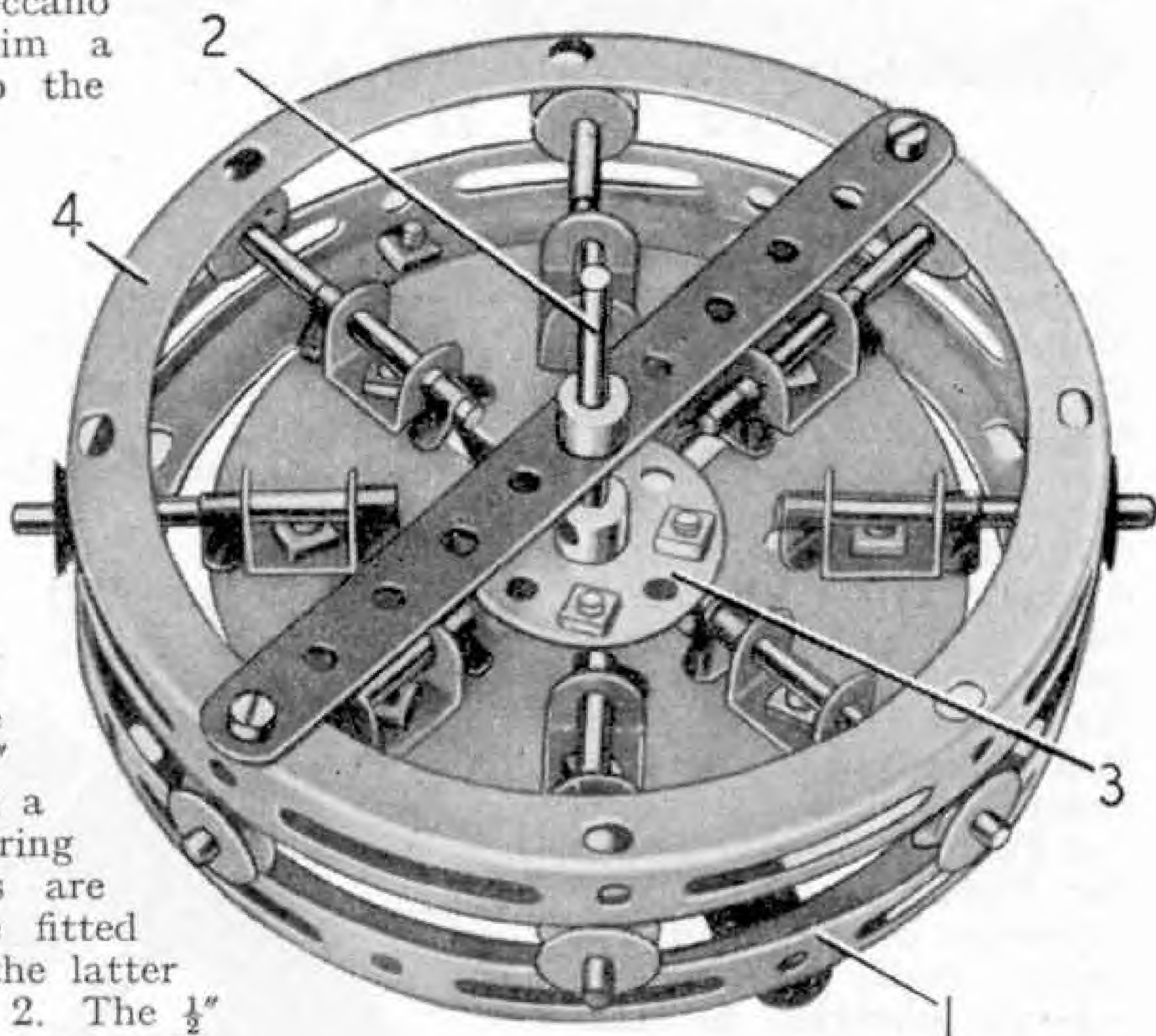


Fig. 1. A roller bearing unit designed by Mr. Nicholson, Mablethorpe, Lincs. Details of it are given on this page.

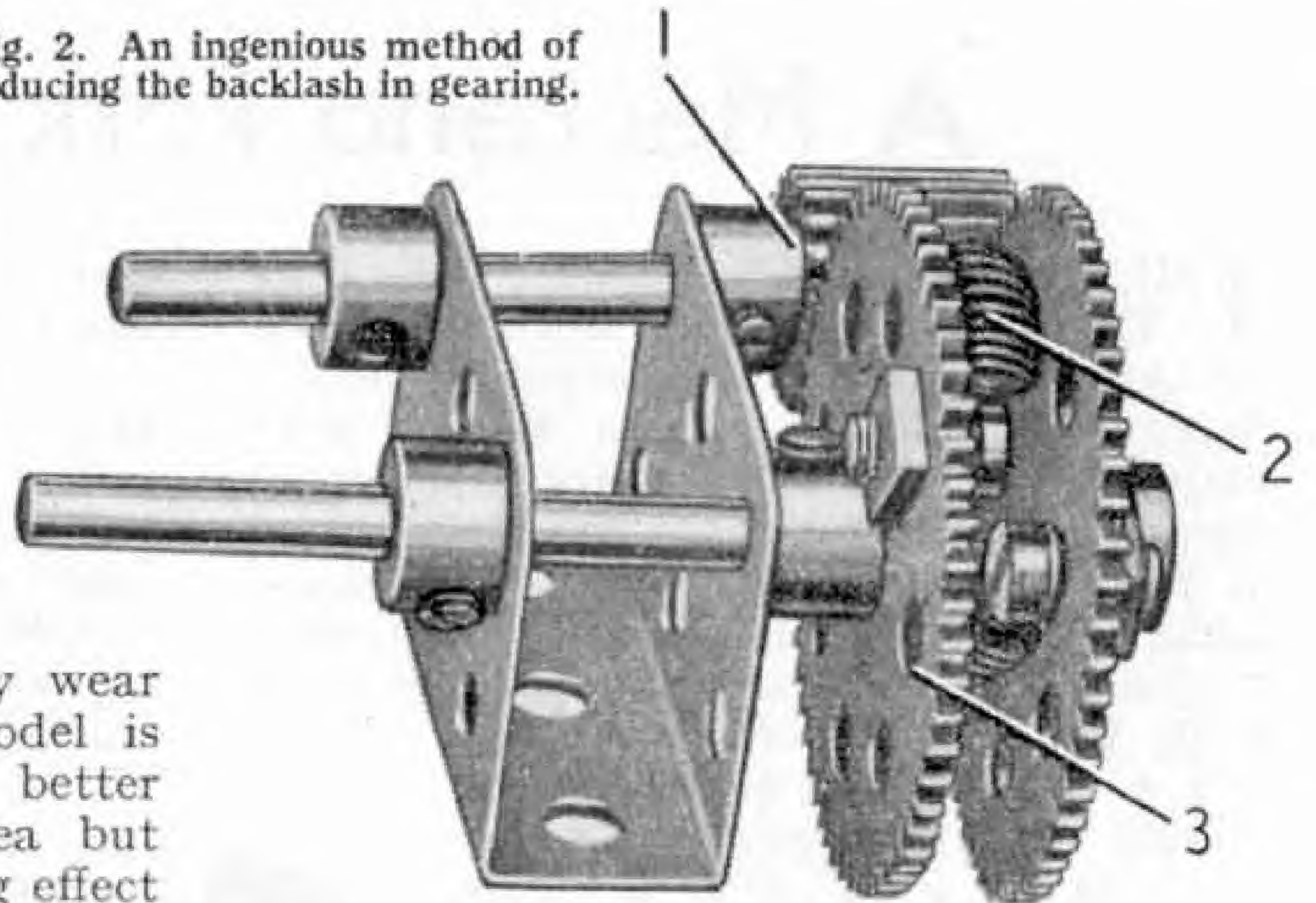
It will be appreciated that any backlash in the Gears allows a limited amount of free movement to the table. Unless the drive is exceptionally steady, this free movement occasionally affects the smooth rotation of the table, and consequently may spoil an intricate pattern.

One method of overcoming the problem

is to use two Gears or Pinions on one of the shafts of each stage of the reduction gearing. As an example, two 57-tooth Gears on one shaft are meshed with the same $\frac{1}{2}$ " Pinion. Before the Gears are tightened on the shaft, however, they are twisted in opposite directions so that all free movement is eliminated in the drive. This arrangement is effective but, as mentioned above, the elimination of the backlash results in a harsh drive, and may wear the teeth of the Gears if the model is operated for long periods. A better system is to follow the same idea but arrange matters so that the twisting effect between the two Gears is controlled by a spring. This arrangement ensures that the free movement is reduced to the minimum, but if an unusually heavy load is imposed on the drive the resistance of the spring is overcome and the correct degree of backlash is permitted between the meshing Gears.

An example of this mechanism is shown in Fig. 2, and it will be seen that two 57-tooth Gears mounted on the same shaft are arranged to mesh with a $\frac{1}{2}$ " diameter, $\frac{1}{2}$ " face Pinion 1. Only one of the Gears is fixed on the shaft, however, and to this Gear is bolted one end of a Tension Spring 2. The Spring is twisted round the shaft, and its other end is bolted to the second Gear 3, which is freely mounted on the shaft. The tension of the Spring tends to twist the two Gears in opposite directions, and so takes up the backlash between them and the Pinion 1.

Fig. 2. An ingenious method of reducing the backlash in gearing.



A Walking Device for a Mechanical Excavator

Fig. 3 shows an interesting arrangement for a walking device suitable for use in a model excavating machine. The mechanism is designed for the average size model and it incorporates a novel ball bearing. It makes use of $\frac{1}{4}$ " dia. ball bearings, which are readily obtainable from dealers in motor car supplies.

A small frame is constructed from Angle Girders and this carries a Face Plate 17, in the boss of which a 1" Rod is secured. A $3\frac{1}{2}$ " Gear Wheel 9 is fitted loosely on this Rod and is held in place by a Collar. A Double Arm Crank 15 is bolted to the inner side of the Gear Wheel, so that its boss is in line with one of the round holes adjacent to the boss of the Wheel. To effect this, the Crank is bolted to two of the elongated holes of the Gear Wheel. A $1\frac{1}{2}$ " Rod 6 is secured in the boss of the Crank.

A rocking member, indicated at 1, is constructed from fourteen $2\frac{1}{2}$ " Strips bolted to a Wheel Flange 19 by means of $\frac{3}{8}$ " Bolts, at the same time fixing a $1\frac{1}{2}$ " Strip 2 to provide a centre hole for the Wheel Flange. The Strips are connected at the ends by pairs

(Continued on page 284)

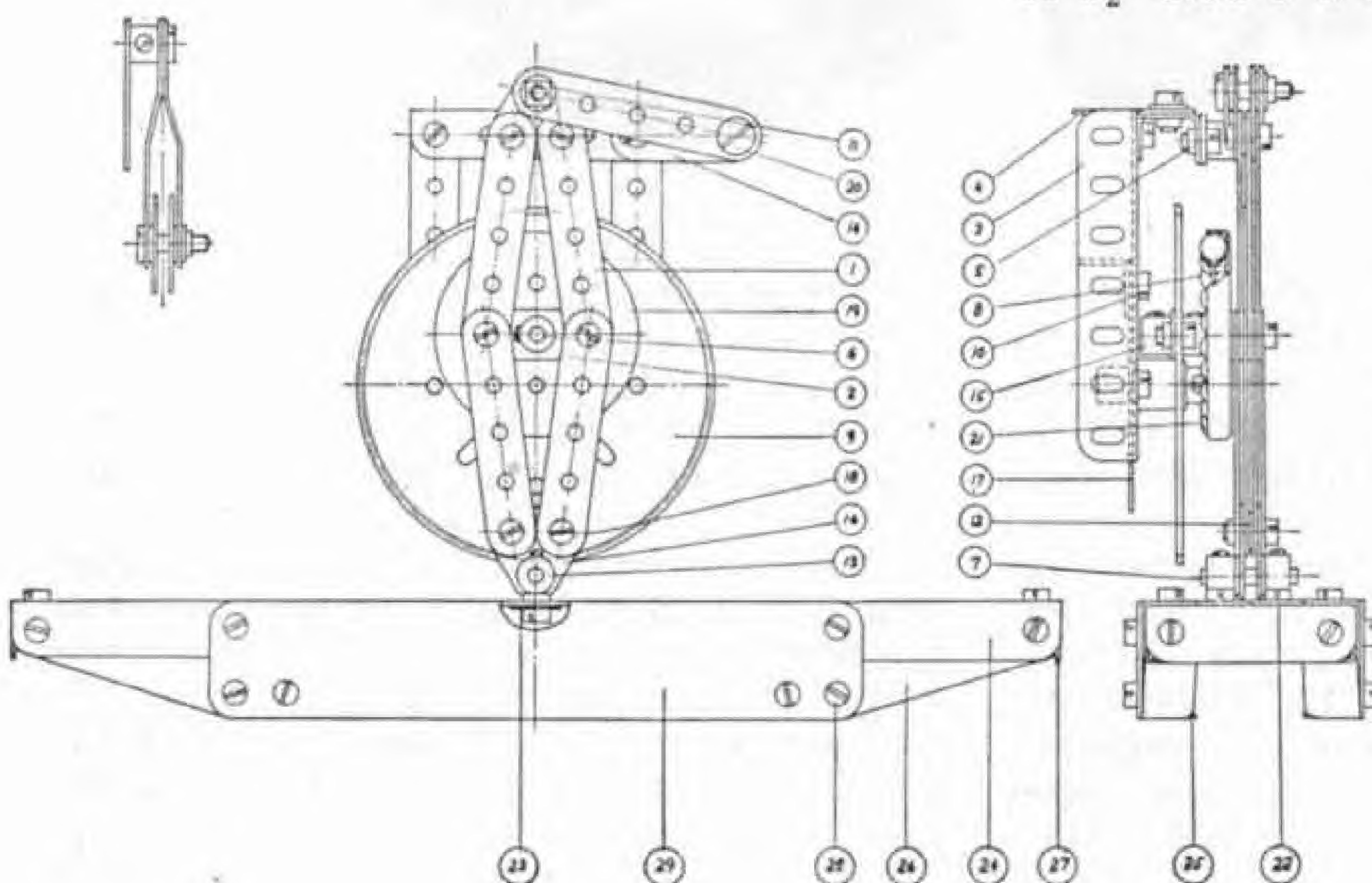


Fig. 3. A walking device suitable for a model dragline or other type of excavating machine. It was designed by N. Gottlob, Hjortekaer, Denmark.

A Meccano Fork Lift Truck

THE chassis of the model Fork Lift Truck shown in Fig. 1 consists of two $7\frac{1}{2}$ " Angle Girders 1, connected by Angle Brackets at the front to a $3" \times 1\frac{1}{2}"$ Flat Plate 2. A No. 1 Clockwork Motor is supported by two Double Brackets bolted to the chassis on each side. The Motor brake and reverse levers are fitted with 2" Screwed Rods, each of which is fixed in its lever by two nuts.

A $\frac{3}{4}"$ Pinion fixed on the Motor driving shaft engages a $1\frac{1}{2}"$ Contrate on a $3\frac{1}{2}"$ Rod 3. This Rod is mounted in the Girders 1

and held in position by the road wheels, which are $1\frac{1}{2}"$ Pulleys fitted with Motor Tyres. The drive to the winding drum that controls the lifting movement of the forks is engaged by sliding Rod 5 to bring Pinion 7 into mesh with a 57-tooth Gear on a $3\frac{1}{2}"$ Rod 9. The latter Rod is held in the Girders 1 by Collars, and it carries a winding drum 10. This drum consists of two Collars with a $\frac{3}{4}"$ Washer at each end. One of the $\frac{3}{4}"$ Washers is spaced from the 57-tooth Gear by three small Washers, and the components of the drum are pressed tightly together by another Collar on Rod 9.

The floor of the driver's compartment consists of four 3" Strips, a $1\frac{1}{2}"$ Strip and a Fishplate bolted to a $2\frac{1}{2}"$ Angle Girder 11 on each side. These Girders are supported by $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates fixed to the front ends of the Girders 1. The lever that controls the sliding movement of Rod 5 is a $3\frac{1}{2}"$ Strip 12. It is lock-nutted to an Angle Bracket bolted to one of the 3" Strips, and is free to move in the gap between the $1\frac{1}{2}"$ Strip and the Fishplate. At its lower end the Strip 12 is fitted with a $\frac{3}{8}"$ Bolt held in place by

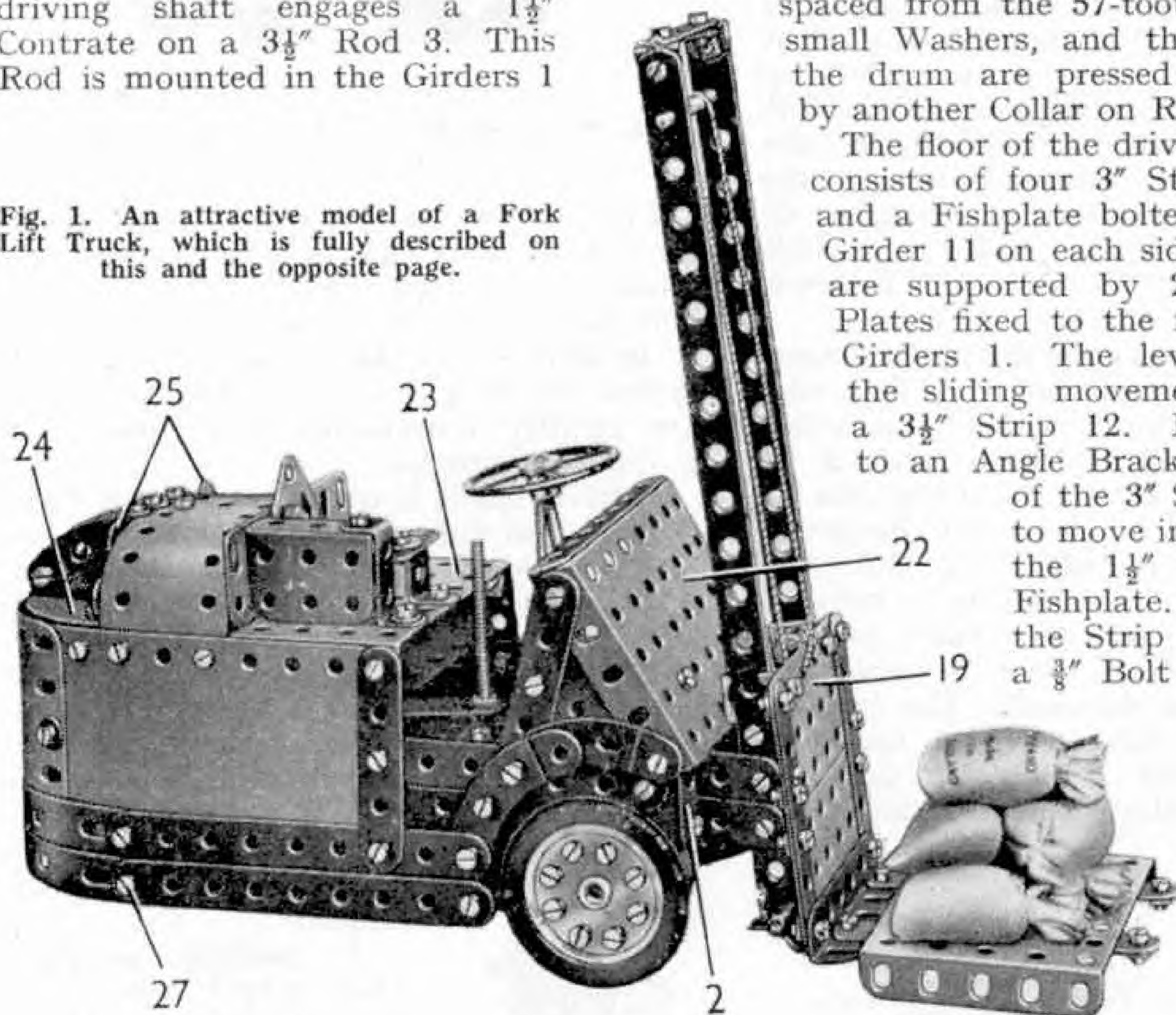
two nuts. The head of this Bolt engages between Pinion 7 and the Collar 8.

The rear castor wheels are 1" Pulleys fitted with Rubber Rings.

They are mounted as shown in Fig. 2 on a 2" Rod supported in two $1" \times 1"$ Angle Brackets, which are bolted to a Bush Wheel 13. A 2" Rod fixed in the Bush Wheel is passed through two 1" Triangular Plates bolted to the Motor side-plates. The Rod is held in place by a Collar.

The steering column is a $3\frac{1}{2}"$ Rod mounted in one of the 3" Strips that form the floor at the front, and in a $\frac{1}{2}"$ Reversed Angle Bracket bolted to this Strip. At its lower end the Rod carries a Crank 14, and to this is lock-nutted a $5\frac{1}{2}"$ Strip 15. This Strip is lock-nutted also to a 2" Strip 16 that is pivotally mounted on a

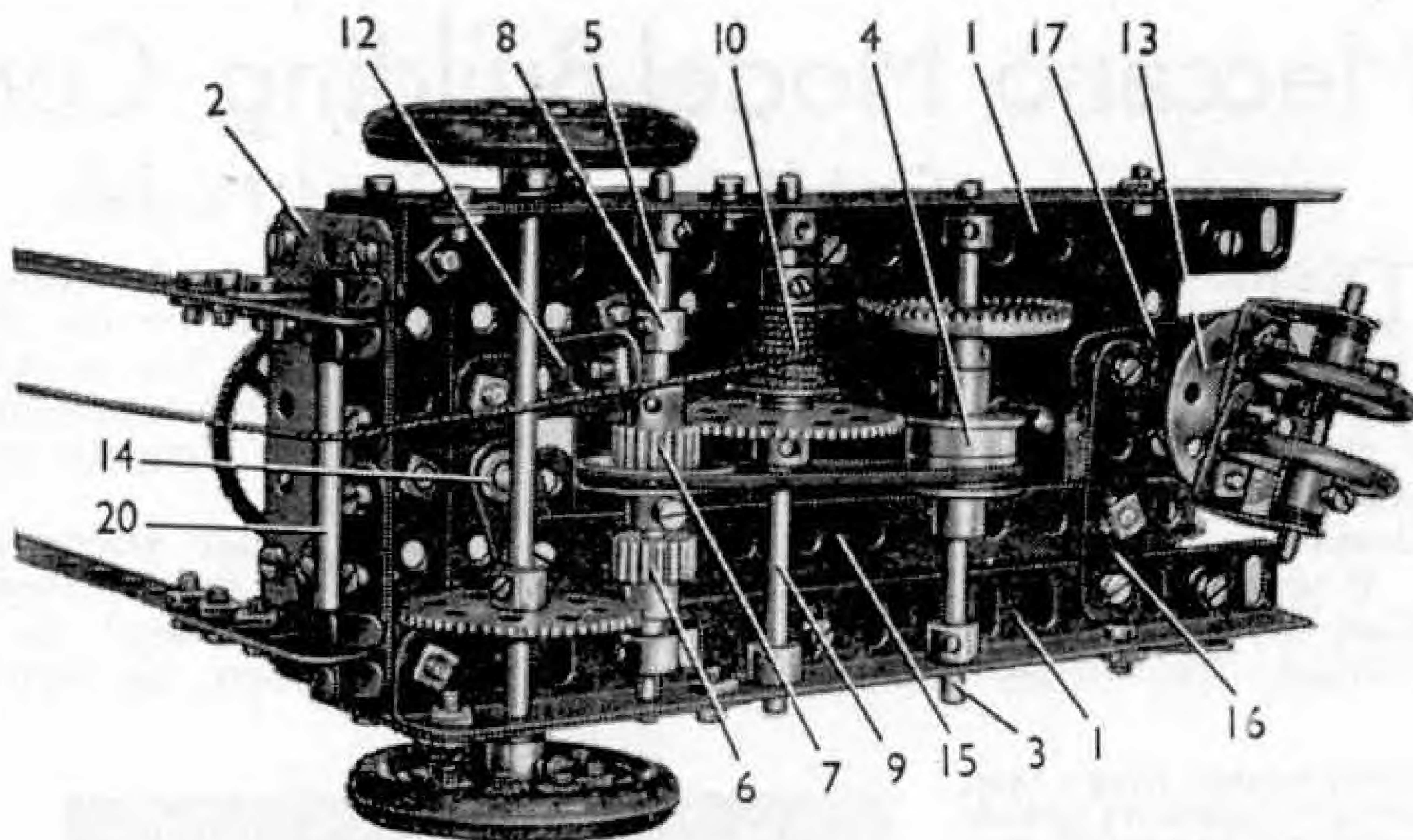
Fig. 1. An attractive model of a Fork Lift Truck, which is fully described on this and the opposite page.



and is held in position by Collars, and is fitted with a wide face pulley 4 made from two $\frac{3}{4}"$ Flanged Wheels. From this pulley a 6" Driving Band takes the main drive to a 1" Pulley on a $3\frac{1}{2}"$ Rod 5. Rod 5 is mounted in the Girders also, but it is free to slide endways in its bearings, within limits set by two restraining Collars. In addition to the Pulley and the two Collars the Rod carries two $\frac{1}{2}"$ Pinions 6 and 7 and a third Collar indicated at 8.

The drive to the road wheels is engaged by sliding Rod 5 so that Pinion 6 engages a 57-tooth Gear on the front axle. This axle is a 4" Rod supported in the Girders 1

Fig. 2. An underneath view of the Fork Lift Truck.



bolt attached to one of the Girders 1 by two nuts. A $\frac{1}{2}$ " Bolt is passed through the hole at the inner end of Strip 16. Five Washers are placed on this Bolt, which is then fixed by two nuts in a 2" Strip 17. The rear end of Strip 17 pivots freely on the

Bolt used to connect one of the $1" \times 1"$ Angle Brackets to the Bush Wheel 13.

The guides for the fork lift platform are two $9\frac{1}{2}"$ Strips, each of which is bolted to a $1" \times 1"$ and a $1" \times \frac{1}{2}"$ Angle Bracket fixed to the Flat Plate 2. The top ends of the Strips are connected by Angle Brackets to a 2" Strip, and a Slide Piece 18 is passed over each $9\frac{1}{2}"$ Strip. Two

$\frac{3}{8}"$ Bolts are passed through a Plate 19. Washers placed Bolt, then tightly on one Slide

Four are passed through a $3" \times 1\frac{1}{2}"$ Flat Plate 19. One on each which is screwed into of the Pieces.

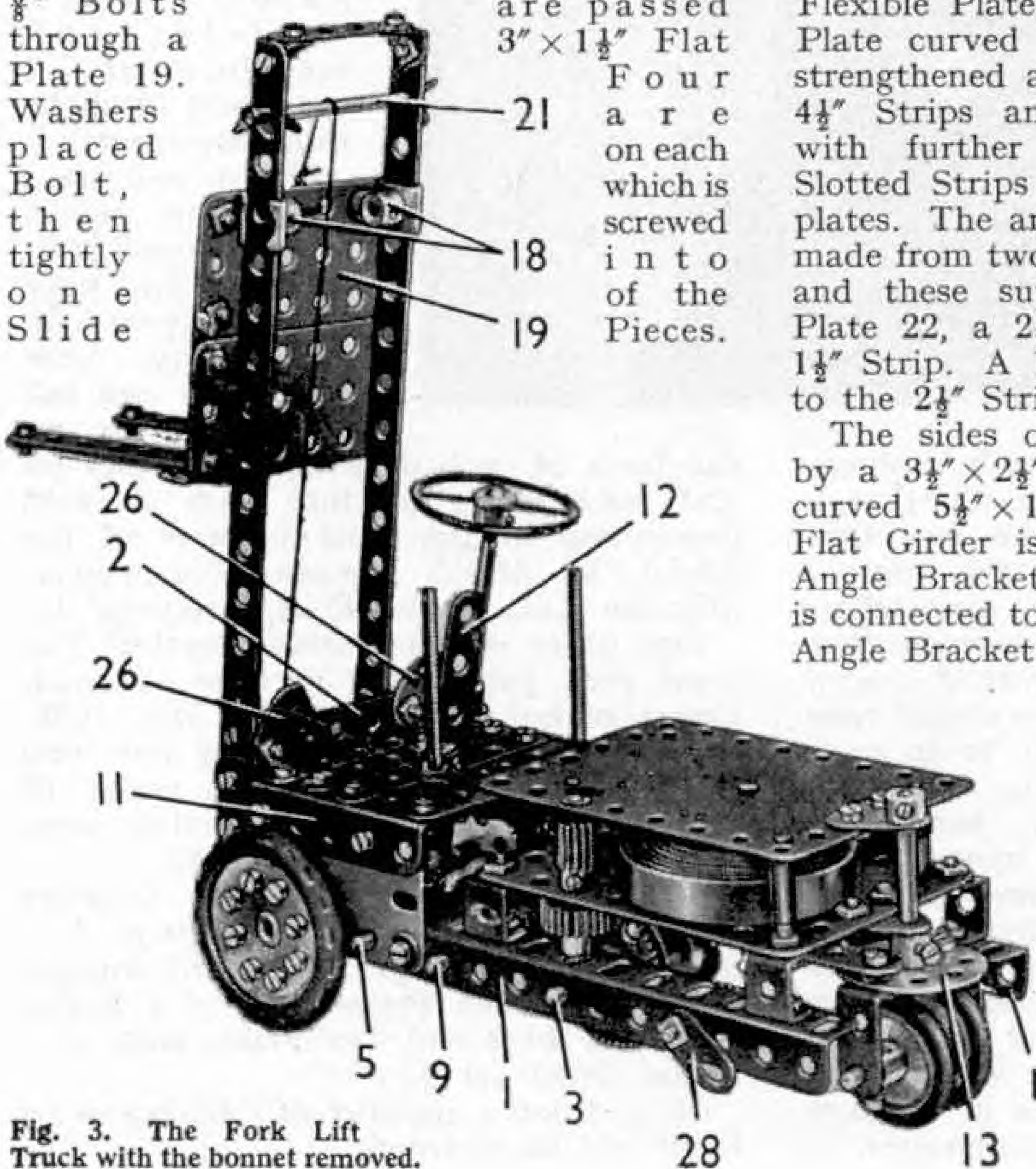


Fig. 3. The Fork Lift Truck with the bonnet removed.

A second $3" \times 1\frac{1}{2}"$ Flat Plate, fitted along its lower edge with a 3" Angle Girder, is connected to the Plate 19 by two 3" Strips. The lifting forks are pairs of $3\frac{1}{2}"$ Strips bolted to the Angle Girder.

A length of Cord tied to the winding drum 10 is taken round $2\frac{1}{2}"$ Rods 20 and 21, and is tied to the Plate 19.

Each side of the body is a $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate, and the back is a similar Plate curved to shape. The Plates are strengthened along their lower edges by $4\frac{1}{2}"$ Strips and Formed Slotted Strips, with further $4\frac{1}{2}"$ Strips and Formed Slotted Strips attached to them by Fish-plates. The arch over each front wheel is made from two $2\frac{1}{2}"$ Stepped Curved Strips, and these support a $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate 22, a $2\frac{1}{2}"$ Strip, a 2" Strip and a $1\frac{1}{2}"$ Strip. A 1" Corner Bracket is bolted to the $2\frac{1}{2}"$ Strip.

The sides of the body are connected by a $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate 23 and a curved $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate. A $3\frac{1}{2}"$ Flat Girder is attached to Plate 23 by Angle Brackets, and a Channel Bearing is connected to the Plate by a 1" Reversed Angle Bracket. The driver's seat is made from two Flat Trunnions and a Trunnion. It is bolted to the Flat Girder and is supported at the front by a $\frac{1}{2}"$ Reversed Angle Bracket.

A $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate is curved and is bolted to the back of the body and to the curved $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate. On each side of the $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible

(Continued on page 284)

Meccano Model-Building Competition

Cash Prizes for Good Models

THERE is still time to win a Cash Prize in the General Model-Building Competition that was announced in the March and April issues of the *M.M.*, but if you have not already sent in your entry you will have to hurry, for the Competition closes on 31st May.

If you are building a new model of any kind we advise you to enter it for this Contest. The prizes offered for the best

given to each competitor's age when judging the merits of his work, and the quality of his model is assessed after making full allowance for the size of Outfit or quantity of parts from which it is built.

One other point—it does not matter where you live. Every owner of a Meccano Outfit can send in a model for this Competition, no matter whether he lives in Great Britain or in any other part of the world.

All you have to do is to think of a new model, no matter what kind, and then set to work to build it as neatly and realistically as you can with the parts available to you. Ships, cranes, vehicles and machines of all types will all make suitable subjects.

When you have built your model make a sketch of it, or better still have it photographed. Then write your age, name and full address clearly on

the back of each drawing or photograph and send these, together with a short description of the chief features of the model, to *March Meccano Competition, Meccano Ltd., Binns Road, Liverpool 13.*

One other very important matter! You must post your entry in time to reach Liverpool not later than 31st May 1955.

The entries will be grouped into two sections. "A" for competitors under 12 years of age, and "B" for competitors over 12 years of age on 31st May 1955.

The following prizes will be awarded in each Section. First, Cheque for £4/4/-. Second, Cheque for £2/2/-. Third, Cheque for £1/1/-. Ten Prizes each of a Postal Order for 10/6 and Ten Prizes each of a Postal Order for 5/-.

In addition a number of Certificates of Merit will be awarded.

David Bretten, King's Lynn, proudly displays the splendid model that brought him First Prize in a recent *M.M.* Model-Building Competition. It represents a Coles Lorry-mounted Crane, and is capable of lifting loads of 18 lb.



models received are well worth winning, quite apart from the satisfaction that a win will bring you from the fact that your handiwork has stood the test of competition against that of your fellow model-builders. We suggest therefore that if you have not yet taken part in one of these *M.M.* Competitions you should take advantage of this opportunity to do so.

Perhaps you think that you are either too young or too old to become a competitor, or maybe you have only a small Outfit and feel that these facts will prevent you from having any chance of success. Any such ideas are completely wrong, however, for the contest is open to model-builders of all ages and for models built from any size of Outfit. To compensate for the differences in the ages of the competitors, full consideration is



Club and Branch News



WITH THE SECRETARY

ON VISITING ACCORDING TO PLAN

The long school holiday in the Summer provides ample opportunity for Clubs and Branches to visit interesting local factories that, by reason of working a five-day week, are not open on Saturday mornings. Such visits—like those at any other time of the year—have to be arranged well in advance.

The company approached will want to know how many members there will be in the party, and once this number has been decided, and accepted by the company, it should not be increased without first consulting them. It may seem quite a trivial matter to decide, on the day of the visit, to take along two or three more members than had been agreed. But even such a small unexpected increase as this can be a nuisance to the company, as apart from upsetting any catering arrangements involved, it may put the firm to the trouble of providing an extra guide for the party at considerable inconvenience.

Club and Branch Secretaries, therefore, should see that their visiting parties are limited to the number of members agreed with the company.

MECCANO CLUB RECENTLY AFFILIATED

LUMINA (LONDON) M.C.—Leader: Mr. J. Tenant, 48 Rhyl Street, Kentish Town, London N.W.5.

H.R.C. BRANCHES RECENTLY INCORPORATED

No. 556, MARSH COURT SCHOOL (STOCKBRIDGE)—Chairman: Mr. D. Watkinson, Marsh Court School, Stockbridge, Hants.

No. 557, EDLINGTON COUNTY SECONDARY SCHOOL (DONCASTER)—Chairman: Mr. K. J. Templeman, 86 Florence Avenue, Balby, Doncaster.

No. 558, ABBEYFIELD ROAD (SHEFFIELD)—Chairman: Mr. B. North, 132 Abbeyfield Road, Pitsmoor, Sheffield 4.

CLUB NOTES

BARKERS' BUTTS COUNTY SECONDARY SCHOOL FOR BOYS (COVENTRY) M.C.—A very successful Meccano and Model Railway Exhibition was attended by about 800 visitors, and a profit of about £25 was made. Representatives of the local Education Committee visited the display, and also a Headmaster and his boys from Bedworth, Warwickshire, who are hoping to start a Club. As usual, after the Exhibition members went *en bloc* to a pantomime. *Secretary*: F. Batten, Barkers' Butts County Secondary School for Boys, Banks Road, Coundon, Coventry.

LUMINA (LONDON) M.C.—More equipment has been bought, and both Meccano model-building and Hornby-Dublo operations are increasing. New members will be welcomed. *Secretary*: J. A. Kirby,

9 Busby Place, Kentish Town, London N.W.5.

NEWTOWN (WATERFORD) M.C.—Members have been working hard preparing for an Exhibition, and some fine models have been built. It is hoped to arrange visits to local factories. Club roll: 10. *Secretary*: F. French, The Blue School, Drogheda, Co. Louth, Eire.

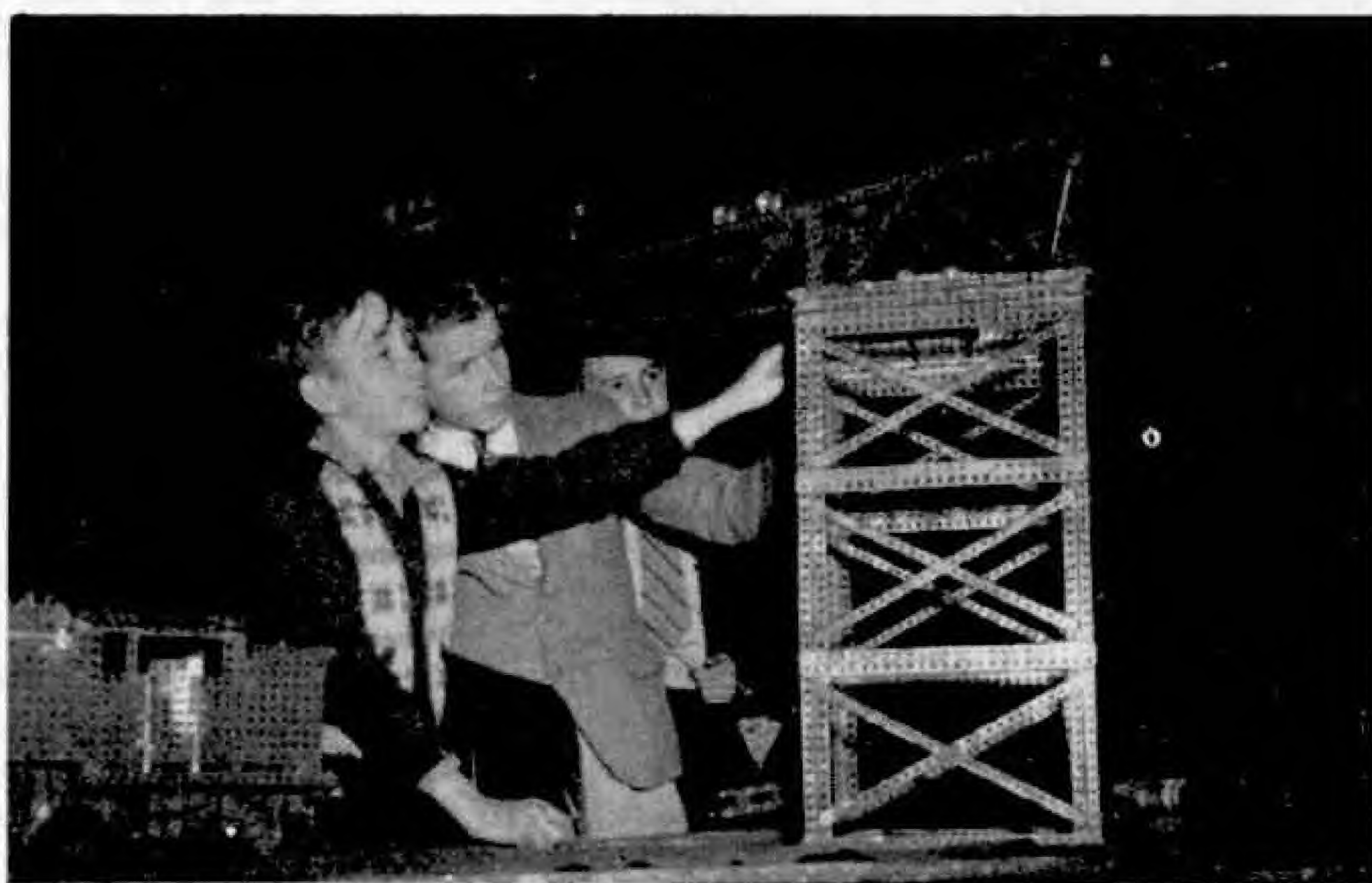
BRANCH NEWS

DROYLESDEN COUNTY SECONDARY SCHOOL—Work is going ahead on the new Hornby-Dublo layout, and members have been busy constructing the baseboard, and lineside accessories. A most interesting and helpful lecture on *Railway Modelling* has been given by Mr. S. Stubbs and Dr. Nathan of the Manchester Model Railway Society. *Secretary*: Mr. J. Lawton, Droylesden County Secondary School, Manor Road, Droylesden.

NORBURY (LONDON)—A visit to B.R. Kentish Town and Camden sheds enabled members to study a good selection of ex-L.M.S. types of locomotives, some B.R. Standards and, at Kentish Town, a few genuine "Midlands." *Secretary*: L. Woolf, 52 Portland Road, South Norwood, London S.E.25.

HINDHEAD AND DISTRICT—A party of members took part in a recent rail tour of Hants., Surrey and Sussex organised by the Railway Correspondence and Travel Society. More recently another party of members visited British Railways' fine Gloucester Road signal box, near Croydon. More outings of this kind are being planned. Non-members can take part in these outings on payment of their share of the cost. *Secretary*: B. J. Hinde, "Hindhead Brae," Hindhead, Surrey.

NEWPORT (I. O. W.) CHURCH OF ENGLAND BOYS' SCHOOL—Plans are being made for extending the Branch layout. At some meetings members have brought along their own Tank locomotives for the benefit of other members. *Secretary*: E. Cousins, C. of E. Boys' School, West Street, Newport, Isle of Wight.



Jim Taylor (left), of Maylands M.C., discussing with admirers the splendid Meccano hammerhead crane built by him and included in this West Australian Club's fine display at the Sports and Hobbies Exhibition held in Perth Town Hall last September. Photograph by courtesy of West Australian Newspapers Ltd.

HORNBY RAILWAY COMPANY

By the Secretary

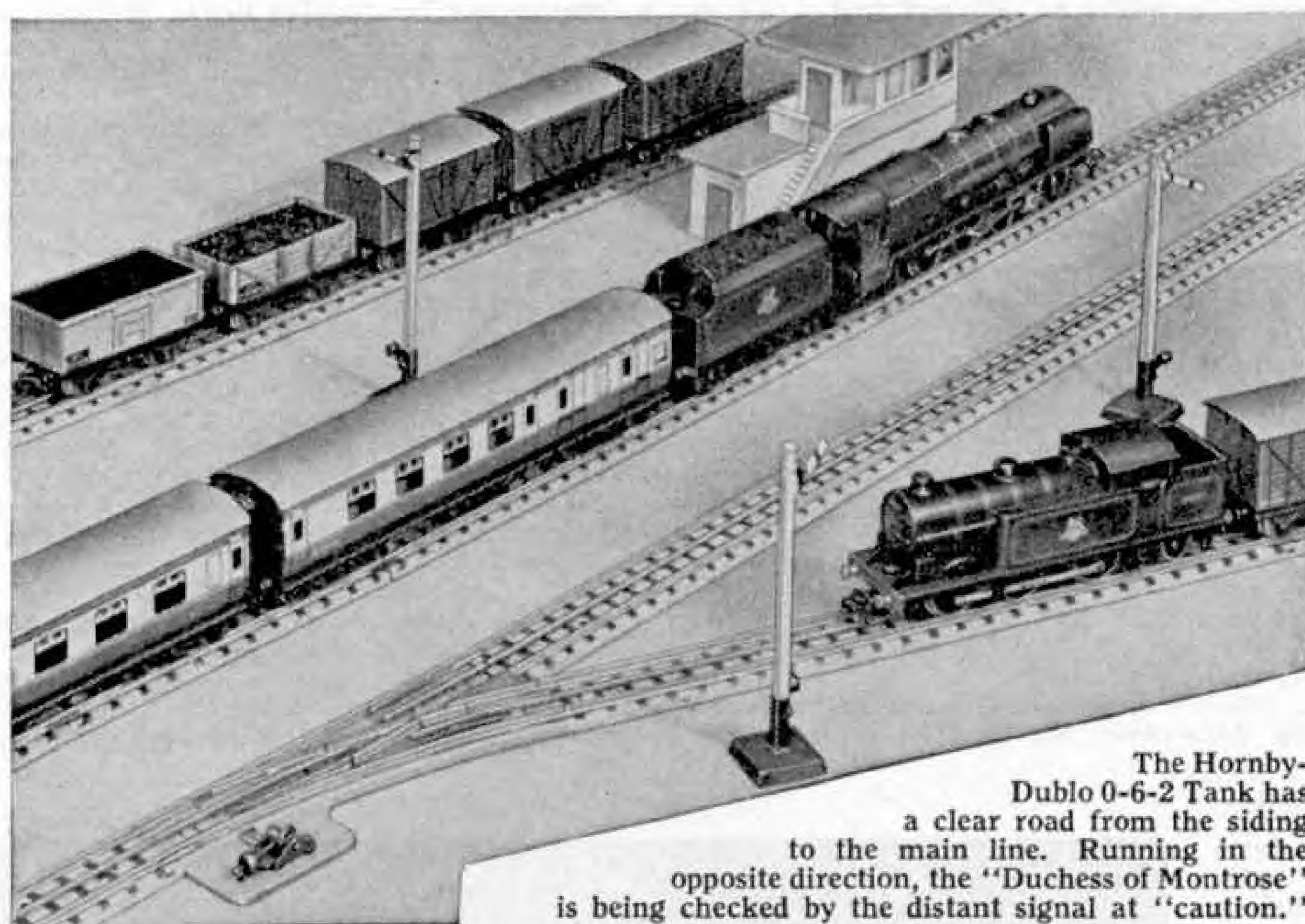
A Useful Isolating Scheme

I AM sure you are all familiar with the use of the standard Isolating Rail and Switch, and the manner in which these are usually connected. In the standard arrangement, of course, one of the terminals on the Isolating Rail is connected to one of the terminals at the front of the Switch, while the other terminal on the Switch is connected to the second terminal on the

Isolating Switch Points are used in what may be termed the lower half of the layout and these are within convenient reach of the operator facing the railway from the lower side of the diagram. Similarly the two Uncoupling Rails in the sidings in the lower half of the system are hand operated, but those in the upper half, and the Points there, are electrically

operated. The Controller of course is connected directly to the Terminal Rail, which is conveniently situated in the left hand bottom corner of the system.

The isolating feature I wish to bring to your notice involves only one Isolating Rail, which is that next to the Points on



The Hornby-Dublo 0-6-2 Tank has a clear road from the siding to the main line. Running in the opposite direction, the "Duchess of Montrose" is being checked by the distant signal at "caution."

Isolating Rail. The Switch should be placed within easy reach of the operator, which in practice means that it is usually somewhere near the Controller.

Now for a new and very useful scheme. On the opposite page I am showing you a layout that incorporates this alternative isolating arrangement, which I think will interest many of you. First a word about the layout itself. This is a good example of an average Hornby-Dublo formation, and you will see that it includes an S-shaped loop connecting the upper and the lower straight stretches. This is a popular arrangement that allows the operator to turn a locomotive or a train in successive movements.

Various sidings—or platform tracks, if these suit your running scheme—branch off on each side of the S-shaped loop.

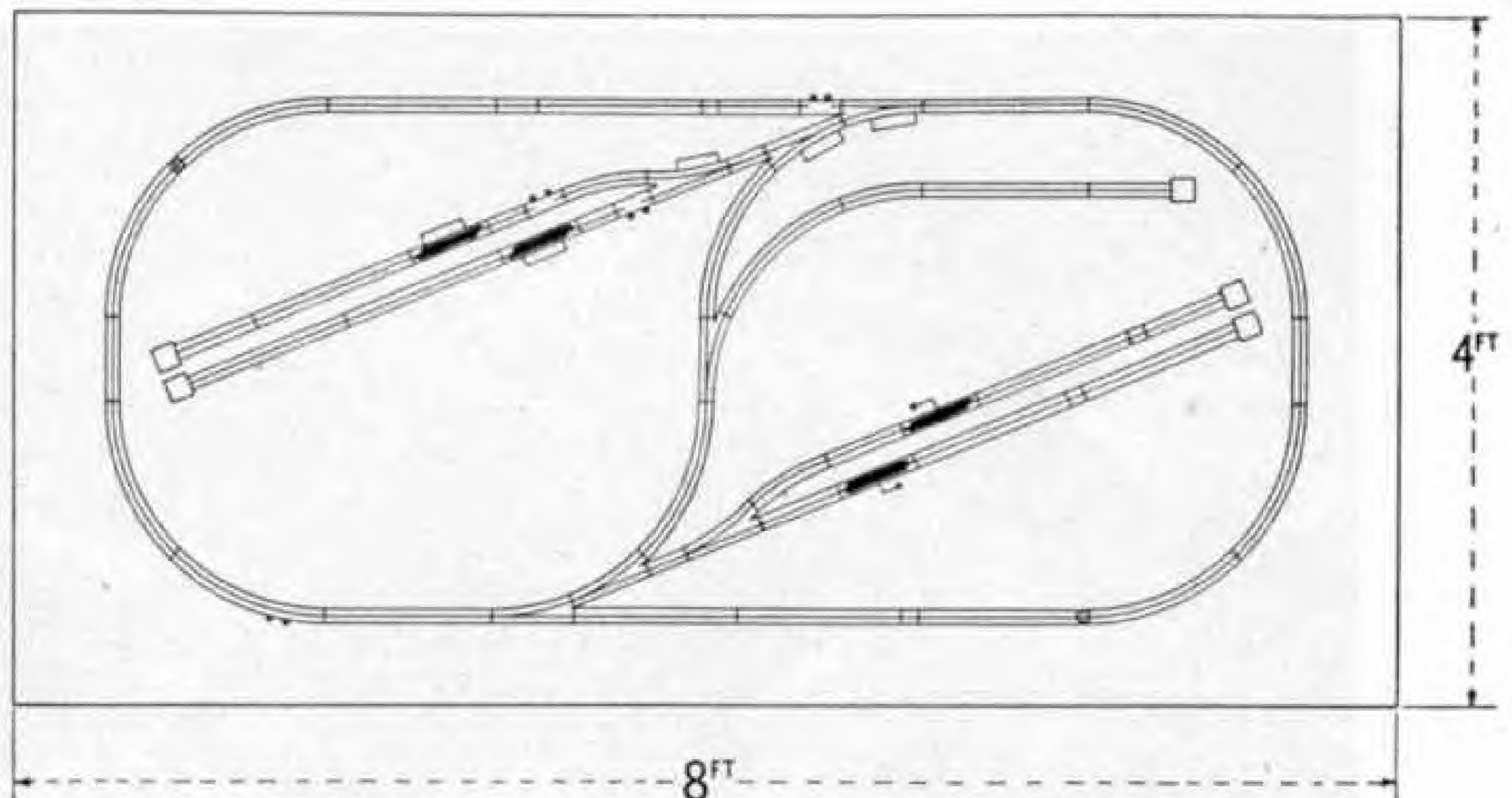
the upper straight track in the diagram. This Isolating Rail lies between two Insulating Tabs, each some distance away from it and denoted by a circle within the rails. Thus the whole length from Tab to Tab forms an insulated section divided by the Isolating Rail.

Now you will see that if each terminal of the Isolating Rail is wired to a separate Switch, and both Switches are wired to the Controller terminal that is connected to the centre rail, you will be able to switch in or out at will *either* the section to the left *or* that to the right of the Isolating Rail, as far as the Insulating Tab in each case. Although this scheme involves two Switches, there is only one Isolating Rail and altogether the arrangement is quite simple, once you come to the point of installing it and using it.

The situation of the two sections that can be isolated "end-on" to one another as it were, has useful possibilities in connection with train operation, especially where several movements in succession involving different trains are concerned. Again, the fact that only a single Isolating Rail is required for the two sections is often a help from the track point of view, as it might not be convenient in a particular

situation to incorporate the two quarter-rail-length Isolating Rails that would be required in the ordinary way.

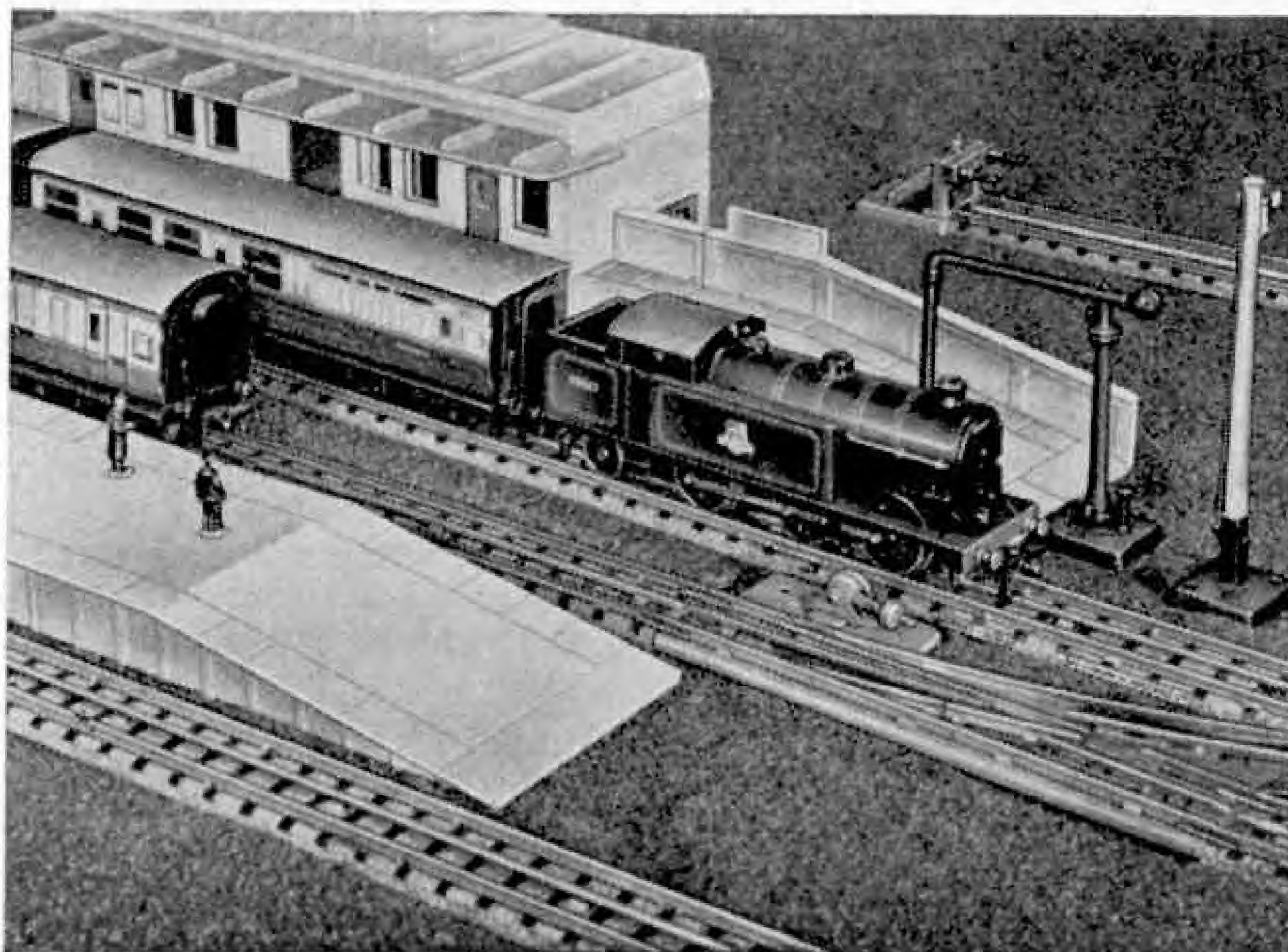
An instance of the type of working where this scheme is useful is shown in the lower illustration on this page. Here we have a Hornby-Dublo 0-6-2 Tank with a train, of empty stock no doubt, waiting at the platform starting signal. It is being held in a section while the other train, of which you can just see the tail end, has been crossed from one track to the other on its way from the sidings.



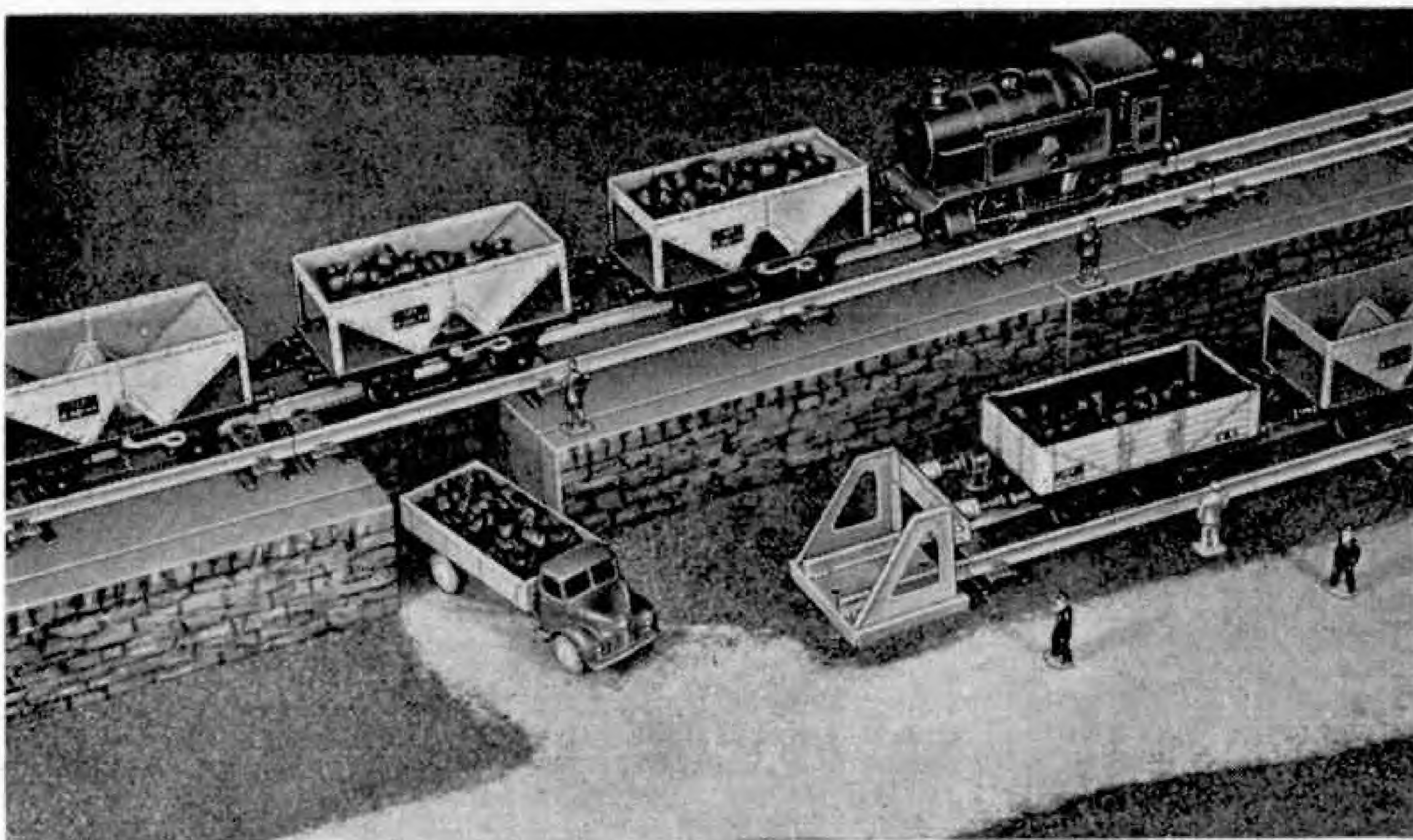
10	EDA1	Curved Rails	2	EUBR	Elec. Operated Uncoupling Rails
1	EDAT1	Curved Terminal Rail	2	UBR	Uncoupling Rails
3	EDA1½	Curved Half Rails	2	EODPL	Electrically Operated Points L.H.
14	EDB1	Straight Rails	1	EODPR	Electrically Operated Points R.H.
8	EDB1½	Straight Half Rails	3	ISPL	Isolating Switch Points L.H.
5	EDB1¼	Straight Quarter Rails	1	ISPR	Isolating Switch Points R.H.
4	EDBS	Straight Short Rails	3	D1	Switches
3	IBR½	Isolating Rails	2	IT	Insulating Tabs
4	D2	Switches	5	D1	Buffer Stops

Knowing where trains can be held and where they cannot is important to the operator, and as long as the position of the Isolating Rail and the corresponding Insulating Tabs is kept in mind there should not be much difficulty. The best reminder is a small diagram of the layout, something like the one on this page, on which the sections are marked.

The switch levers corresponding to the various sections and those controlling such items as Electrically-Operated Points, Signals or Uncoupling Rails also should be shown on such a diagram, and if this is mounted on a piece of stiff cardboard or wood it can be placed near the control equipment, so that the operator can easily see it. It would in fact correspond to the track layout diagrams that form part of the equipment in a real signal box. Numbers, letters or colours can be used for identification.



A train of empty stock headed by a Hornby-Dublo 0-6-2 Tank is halted at the platform end. The other train has just crossed from the sidings on the far side of the main line.



Fun in the Goods Yard

Things All Hornby Railway Owners Can Do

IN several articles recently we have talked about goods train working on Hornby Railways. There is plenty of interest in this and most Hornby Railway owners certainly get plenty of fun from it. The rolling stock available is varied, and you can really play with the different vehicles because they offer splendid opportunities for providing realistic loads.

The actual handling of some of the loads is a point that we have not touched on to a great extent before. Look at the picture on this page. It is a view of a special installation that is of particular interest. This includes a raised track, a very useful section of the line.

The exact manner in which the rails of such a section are to be supported can vary. In the picture the raised path for the track has been provided simply by built up woodwork, and any Hornby Railway owners who decide to follow up the scheme will not have much difficulty in arranging something similar. A structure built of Meccano Parts would do equally well, and in fact it would represent reasonably well the type of raised gantry used for such purposes in many industrial installations.

Now there is a sound idea behind the provision of this raised structure. It is that road vehicles—in this case a Dinky Toys

Leyland with a drop tailboard—can stand *underneath* the track, ready to receive the load discharged through the floor of the Hopper Wagon above.

The necessary gap in the structure or "bank" is made to coincide with the spacing between two of the sleepers on a standard Straight Rail, and the opening thus left between the running rails allows the discharged load to pass through. The scheme works quite well as long as the load is not allowed to discharge too quickly and

thus swamp the road vehicle. Small stones can be used, or dried peas, one of the old favourites of Hornby railwaymen for jobs like this; but don't

use real coal, as it is messy, and the use of sand too is best avoided.

Even if your layout is not big enough to include such an arrangement as a permanent feature, you will perhaps like to try the idea out in a temporary set-up. If you are able to fix up a scheme on these lines you will have plenty of entertainment from it.

The train shown standing on a raised track is made up of one kind of wagon only, and others may consist of perhaps just one type of van. But there are many other freight trains, of equal importance, that are of more varied composition. In the

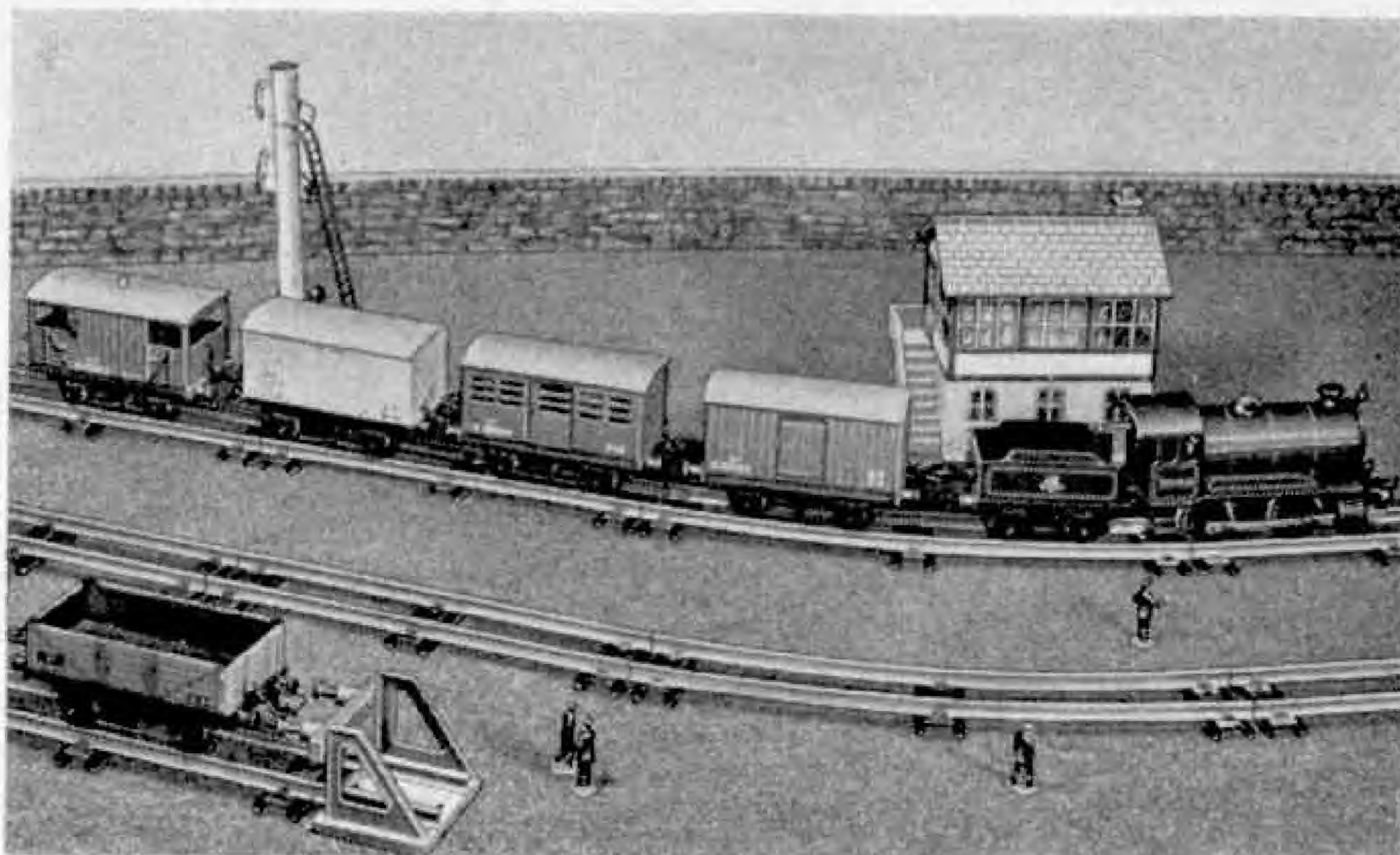
In the illustration above Hornby Hopper Wagons are standing on a raised track which has special arrangements below for the discharge of loads between the rails.

upper picture there is a good example on a Hornby layout that will help to show the younger Hornby railwayman that he can run quite realistic trains or vans, even though he may have only one vehicle of each particular type.

Each of the vans shown in this picture will be familiar to all of you, and you will not need to be reminded that the sliding doors provided in them allow plenty of fun in the loading and unloading. The freights you carry can vary and from the point of view of handling the actual goods do not forget that the Dinky Toys Coles Mobile Crane is a very good thing to have in your Hornby goods yard. When operating at ground level it can be made to poke its jib through the doorway of a Hornby Van; but the "crane man" does admittedly need nimble fingers for the hooking up or unhooking of a load! Still, it is all good fun, and something like this makes a change from the normal round of train running only.

Any of the Hornby Clockwork engines is suitable for goods train running. For the longer-distance trains a tender engine should be used, the Hornby No. 40 Tank

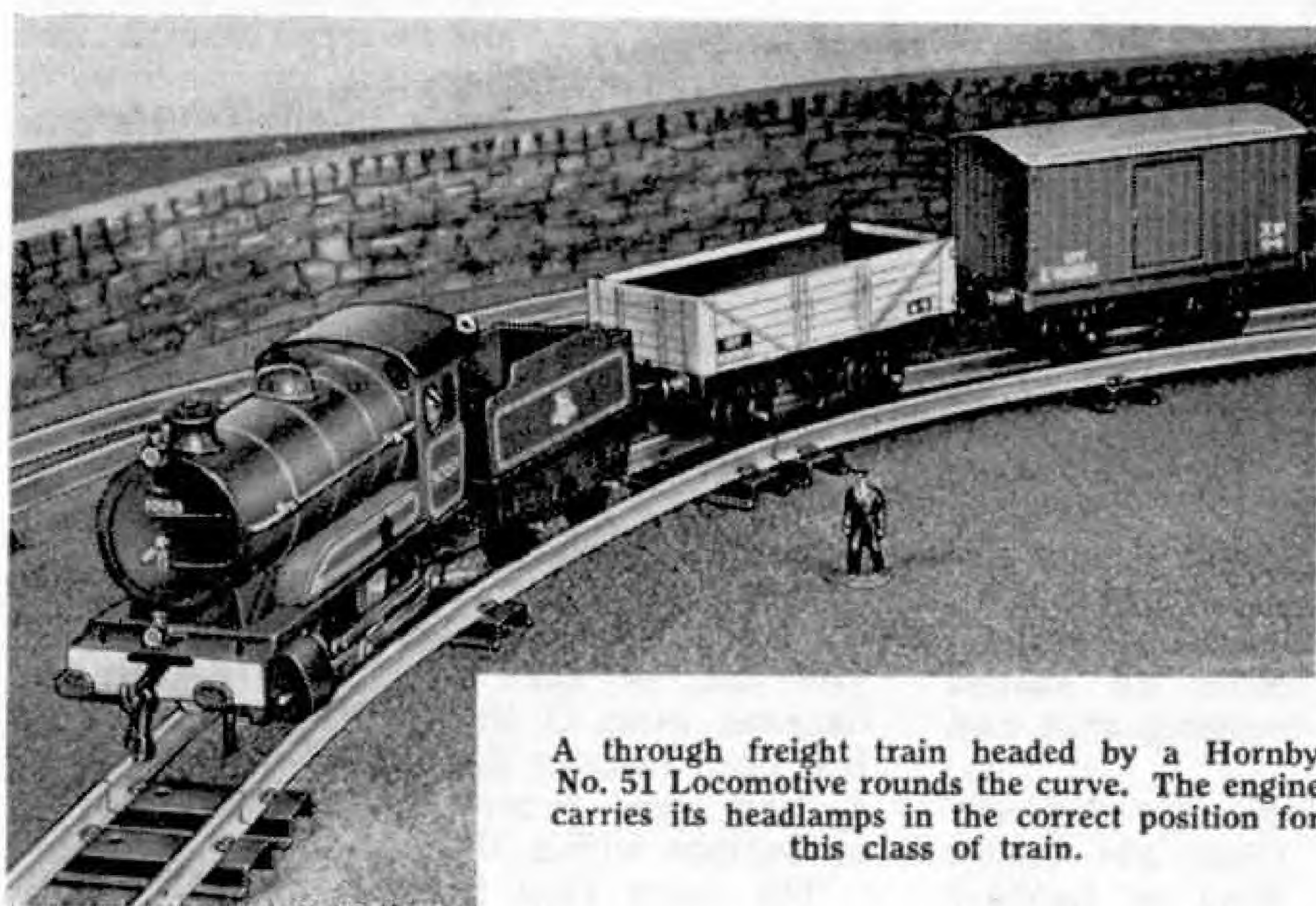
being reserved for shunting and shorter distance work, or for jobs like that shown in the picture on the opposite page. With the largest engines in the current



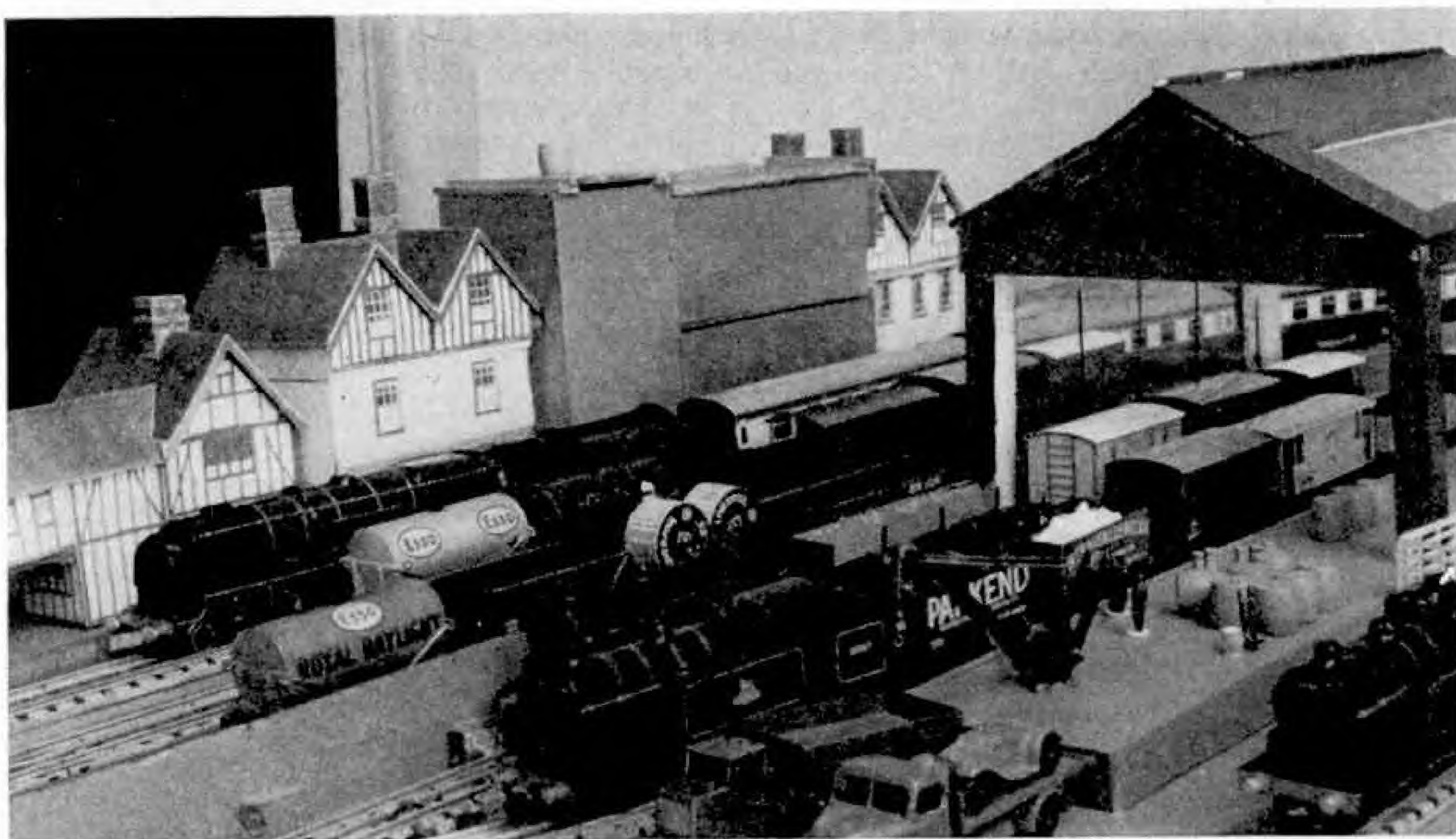
A fast goods train composed of various Hornby Vans makes its way past the Signal Cabin.

range, the Nos. 50/51 types, the operator has a choice, if he has one of each engine on his line. The black No. 50 makes a very suitable engine for goods train work, but the similar green-painted No. 51 can be used equally well. It is a common sight nowadays for a real passenger engine to be seen on freight duty, possibly in between spells of passenger work, and there is no reason why the Hornby Railway "Traffic Controller" should not make use of a similar arrangement.

Whether the No. 40, 50 or 51 Locomotive is used we must see that it carries the correct lamps for the job. Probably many of you know the correct indications for different classes of trains, but those who do not will find them out on page 12 of the Hornby Railway Company Booklet. It makes our train running all the more interesting if the lamps, which are detachable, are being used properly because, after all, they do mean something



A through freight train headed by a Hornby No. 51 Locomotive rounds the curve. The engine carries its headlamps in the correct position for this class of train.



How? and Where?

The Best Place for a Hornby-Dublo Railway

HOW and Where? Those are questions that every owner of Hornby-Dublo equipment asks himself when he begins to plan his railway. Hornby-Dublo is primarily a table system, but some owners may have to arrange their layouts elsewhere, and of course there are other schemes, especially if the line is to keep on growing, as a line should. So let us look at some of them.

To begin with, there is the floor. Now this is *not* recommended, but if the floor is the only place available, then the floor it will have to be. Fortunately, most floor tracks are not laid down for very long, so there is ample opportunity for cleaning the rails, and the rolling stock too if necessary, after running is over. A floor layout indeed can be good, if these points are watched, but it is surprising how much dust can be picked up by the components, and it is particularly necessary to examine them regularly and well in case such unwanted items as carpet fluff find their way into running gear and working parts.

One thing the floor does offer is a fair amount of space. But there are bound to be obstacles of one kind or another

that the Hornby-Dublo engineer has to get round, which may be a nuisance, although they give scope for ingenuity, and floor levels may not be too satisfactory. So keep off the floor if you can.

This brings us back to the table. A dining table, well protected, of course, can usually be made useful. The ordinary domestic table can be used sometimes—by leave of the authorities, of course—

but a modern table may not be large enough, and therefore the amount of space available for the layout is limited. Using it has the advantage for a young owner that his railway usually is handy,

so that other members of the family can be pressed into service when necessary—and they won't need much pressing!

A genuine Hornby-Dublo table railway is shown on the opposite page. It belongs to Joe Macano, Gibraltar, a keen Hornby-Dublo enthusiast and H.R.C. member (No. 245711). At present it is simple, but you can be sure that it will grow by degrees, even if the table on which it is laid does restrict the size of the main line. I can see future sidings and other extensions within the oval.

The next step is from the table top

Above is part of the layout arranged in sections by R. Kirkham and J. W. Thompson. The photograph, by Derek G. Johnson, shows a busy period at the goods depot.

railway to a larger one on a layout board, on which the track can be arranged more or less permanently. Sometimes it is necessary for storage purposes for such a system to be arranged in two or more sections, with special arrangements to allow the different pieces to be joined up for use.

The illustration on the opposite page shows part of a layout of this kind that is remarkably realistic. This has been built up jointly by R. Kirkham and J. W. Thompson, and was mentioned in the *M.M.*

Terry Roff and his father enjoy a spell of running on the Hornby-Dublo railway referred to on this page. It is obvious that both enjoy their railwaying.



for November last. It is in twelve separate sections that can be bolted together, and the complete system when assembled covers an area 20 ft. by 15 ft. No pains have been spared to make it completely workable, and the illustration shows that the ideals aimed at have been realised. In it the layout has the good solid appearance that permanence gives.

There are five main circuits on the system, so that five engines or trains can be moved at one time. Isolating sections have been incorporated to the fullest possible extent, and in running twelve different engines are worked in turn at different times. In addition, four other engines can be standing by, ready to be brought into the working scheme as wanted. So obviously the amount of traffic flowing on the layout is considerable. No wonder

the picture of it shows that the system is a particular busy one.

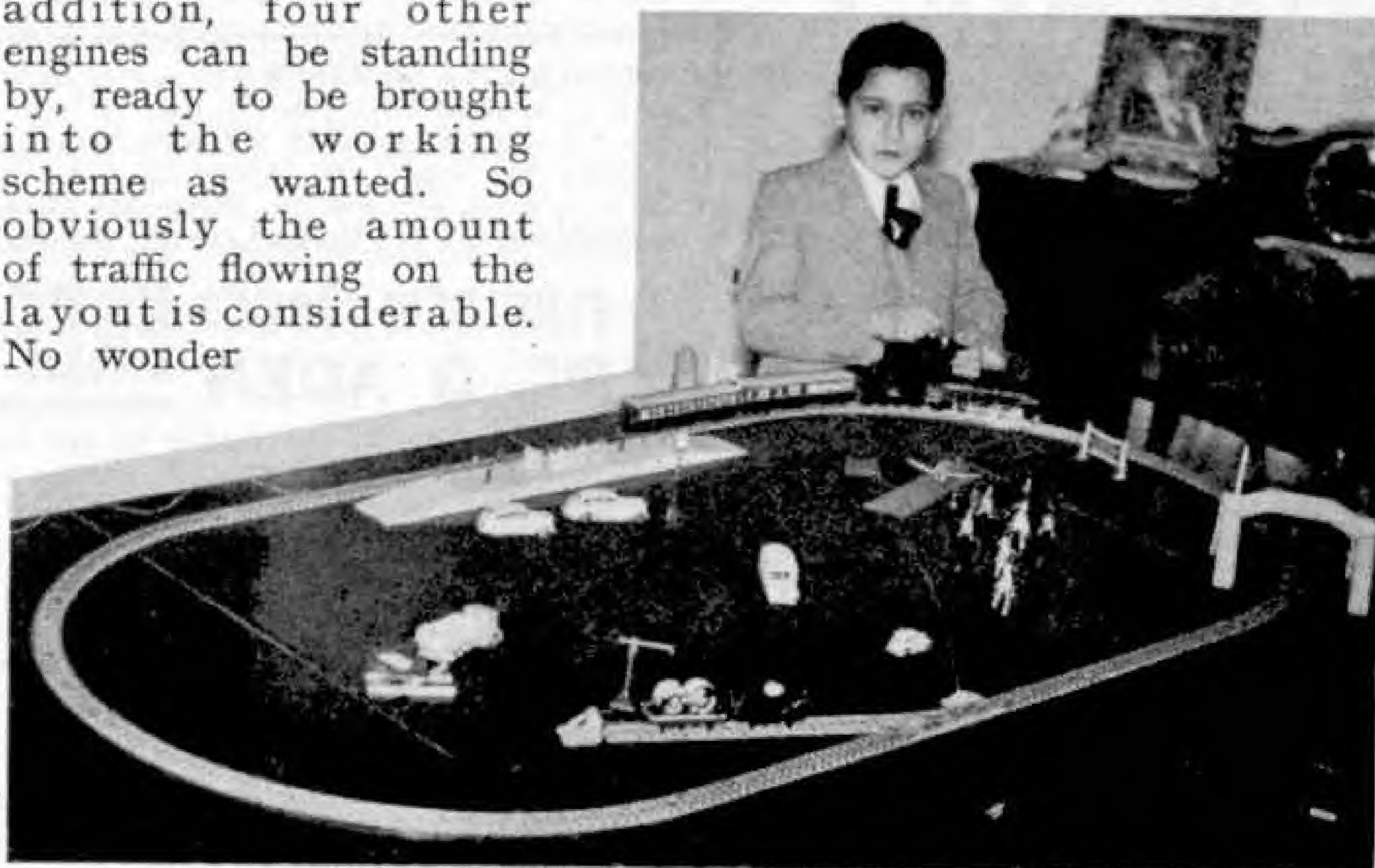
The special attention given to lineside effects has helped greatly in giving the railway a sound look. The line really does look as though it serves someone. All too often, extensive lines that may be

excellent from the running point of view are found wanting because there is no sign that anybody lives near them, or wants to use them!

From this somewhat specialised type of layout we pass to a simpler system that again is a company affair, but this time the company consists of father and son, not by any means an unusual combination. The joint owners are Terry Roff and his father, both of whom you see in the picture.

Terry has to spend a great deal of his time in bed. But this has not stopped him from having a good time with his

railway, for a board has been ingeniously planned for support by trestles, one at each side of the bed, and Terry works the whole system easily. And the railway is growing. The partners are now planning a lighting system.



A Gibraltar enthusiast, Joe Macano, with his Hornby-Dublo layout. This system is literally a table-top one.

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WRIGHT'S STAMP SHOP
(M67) - CANTERBURY KENT

Stamp Collectors' Corner

By F. E. Metcalfe

FARTHEST SOUTH

SOME little time ago a reader of these philatelic notes asked if I could tell him why Argentina was making such a "fuss about what was merely frost and ice." Well, the British expedition that hopes to cross Antarctica has drawn our attention again to this bleak part of the world. Not only Argentina, but other countries as well think that this old "Imperialist" country, which is what that once very friendly nation is calling us just now, is on to something good; otherwise we should not be spending a lot of money on an expensive trek across icy wastes.

As a matter of fact, it is thought in more than one country that extensive mineral deposits may exist in the extreme south. But it is Argentina that is doing most about the Antarctica philatelically. It will be remembered that our possession of the Falkland Islands—Las Malvinas to the Argentinos—is hotly disputed, and to show that Argentina did not recognise our rights there, she issued a stamp that has been illustrated previously and is reproduced as the first of the three seen at the foot of the page. As can be seen from it, "Las Malvinas" are shown as belonging to the River Plate Republic.

Britain is used to such pin pricks, and does not worry too much so long as they are confined to paper. But Chili objected very strongly, for her territory had been postally captured! Diplomatic representations were made, and rather sheepishly Argentina had to recast her claims. So a second stamp was issued, and also is illustrated below. It will be seen from this, that the poor old Falklands remained in Peron's grasp, but he had released the southern part of Chili.

Argentina has not been content with stamp claims, for bases have been established in the Falkland Islands Dependencies, and once or twice we have had to protest about their presence. But up to now nothing serious has upset the relations between our countries, who have hitherto been such great friends, and no doubt will be so again when this southern wave of fiery patriotism has calmed down.

The latest move in the postal battle is for Argentina to issue yet a third stamp, this time claiming not only the Falkland Islands, but a

fair sized chunk of the Antarctic. It may be that soon she will be told, ever so gently, but ever so firmly, just where to get off, not only by Britain, who claims the same slice, but also by Chili, who does not agree to allow her neighbour to horn in on what she considers her preserves.

We also have issued stamps for the far south. In fact only recently a really handsome set was issued for the Falkland Islands Dependencies, probably for political reasons. Each stamp bore an illustration of one of the many vessels that have been used one time or another in

exploration of the

region, and I am sure that many of you have copies of all, or at least some of them—more likely the latter, for the set goes up to £1. Some rather caustic comments were made in consequence when the set was first issued. Still it is such a very fine set that one can almost forgive the authorities responsible for the issue.

New Zealand is another country which has philatelic connections with Antarctica. In 1908, when Sir Ernest Shackleton organised his first expedition, a New Zealand 1d. stamp—what is known as the Universal Postage design—was overprinted King Edward VII land. In 1911 two stamps of New Zealand, ½d. and 1d., were overprinted Victoria Land, and used by the Scott Expedition of that time.

These stamps are listed in Gibbons. They could not be logically kept out, for they were issued by the New Zealand Post Office, and used officially on correspondence. A comment in the catalogue that the stamps were not strictly necessary can be completely ignored, for about half of the stamps issued by most post offices come into that category. Personally I think these are two exceedingly interesting issues, and it is a pity that each stamp costs about a pound, for a collection of Antarctica, suitably written up, would be very nice to own, and most of the stamps concerned are not expensive.

The latest Antarctic Territory stamp was issued by Australia last November. Details of the stamp itself have already been given, but it may not be generally known that special

(Continued on page 284)





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Stamp Gossip

CANADA

WHEN the 10c. stamp with the wigwam and pegged-out skin design was issued in October 1950 there was considerable criticism. As we saw over the first Queen Elizabeth portrait set, when the Canadian public grumbles about its postal issues their Post Office does something about it, and now we have a new 10c. stamp, issued on 21st February, that will surely please everyone, if such a thing is possible. I am sure Meccano readers will like the stamp illustrated, and if you come across any copies



with a large G overprint, you will have got a copy of the official stamp, which was issued on the same day. Many are used, so quite a few will no doubt find copies.

I must admit that I am very fond of modern Canadian stamps. Some of the designs are in my opinion really beautiful, but I think this latest about takes the prize. I even think it as good as the Coronation stamp, which will come into its own when we rid ourselves of the pretty-pretty complex, and cease to believe that good portraits must make the subjects look like cinema stars.

NETHERLANDS

The Netherlands issues a lot more stamps than Canada, but nevertheless is releasing many interesting examples. These are much sought after by collectors in Britain, for most things Dutch are popular with us, and one of these nice stamps is illustrated. It belongs to a set of five values issued during the middle of last November, one of the regular sets issued by the Netherlands for Child Welfare. Each stamp has a surcharge for charity. In other words, though the stamp illustrated costs 5c. it has a postal value of only 2c., and in some countries—not New Zealand, where Health stamps are used postally—about the only people who use stamps with such a surcharge are stamp collectors. Not so in Holland. They are very keen about child welfare, and do not mind contributing by the purchase of such stamps to projects that raise funds to assist in the work.

The stamp shown depicts two tots making paper chains, and one in the set shows another brushing her teeth. Perhaps this will not be a particularly popular stamp among the other young collectors!

A delightful set, as these Dutch issues generally are. Some time ago I saw a collection of Child Welfare sets nicely written up, and it attracted all who saw it. The entire collection had only cost a few shillings.

PALMS AND COWS

There was a time when all those stamps that have been dubbed pretty-pretty by disgruntled collectors, some of whom get awfully annoyed if you don't like the stamps they like, came mostly from the American republics. But latterly Europe, with its technical and artistic superiority, has taken a hand in the game, and now



produces most of the stamps that so attract all who see them.

We still get many interesting Central American issues, however, and the one illustrated can surely be classified under this heading, even though the design is a rather quaint mixture of the exotic and the homely. The description at the bottom of the stamp reads *Example of Nicaraguan Cattle*, which we hardly associate with palm trees on a triangular stamp. Nevertheless it makes quite an interesting subject.

SOUTH AFRICA

The new set is proving very popular, not only with collectors of British Commonwealth but also with thematic collectors. But in view of the fact that previously South African stamps were always overprinted for official use—that is, many of the definitive values—collectors are wondering if this new Zoological set will be similarly overprinted.

Apparently the answer is no, so one can go right ahead mounting up, without leaving spaces for stamps that are not going to be issued.

There is no definite news about South West Africa, which also brought out a new set recently, and also overprinted its ordinary stamps for

official use; but it is understood that like South Africa there will be no overprinting for official purposes.



TURKS AND CAICOS ISLANDS

It is not often that anything to do with stamps happens in this country, so when anything does it is news. On 1st February we had two new stamps, both bearing the Queen's portrait. One depicts the motor vessel *Kirksons*, built locally, I understand, and the other a flight of flamingoes. This latter stamp is being illustrated.

I once saw such a flight and will never forget it. It was in South America. While motoring I suddenly looked over to the left, and rising from what appeared to be a temporary sheet of water were a number of flamingoes. No doubt the car had disturbed them, but they made a glorious picture as the Sun caught their shell pink feathers.

STAMP AUCTIONS

Small collections are offered in most auctions, and if a catalogue shows that a suitable collection is to be sold it will be best to have it sent home to see if it is what you want. Auctioneers are willing to do this if the stamps are sent back by return of post, and post both ways is paid. But do not ask for collections unless you are quite serious, and have cash to spend. If you do find what you are after, you will have made a start at probably a reasonable cost.

Blondins of Industry—(Continued from page 229)

also can be given by means of telephones connecting the operator with a signaller on the site.

Two Henderson aerial cableways were used during the construction of the Loch Sloy dam, in the north of Scotland, which is 1,200 ft. long and provides a reservoir storing 1,200 million cu. ft. of water. Thousands of tons of concrete were transported into position during the building of the dam by means of the cableways. These had a span of 1,350 ft., and the tail carriage of each machine could be travelled over a distance of 150 ft., by electric power. The two fixed headmasts were 125 ft. high, and the tail carriage 36 ft. The maximum load on the hook of each cableway was 10 tons, this including the weight of the skip and the slings, together with the contents. The skip contained four cubic yards of concrete, which could be placed at any point over an area of 8,700 square feet.

Other great engineering schemes on which these cableways have been employed include the building of the Otto Beit bridge in South Africa, the Conisborough Viaduct near Doncaster and the reconstruction of the Menai Bridge. Besides the building of innumerable dams in all parts of the world, cableways have been used in causeway construction, notably at Scapa Flow, the famous Fleet anchorage in the Orkneys.

Road and Track—(Continued from page 247)

the four-speed gearbox is developed from the three-speed Vanguard box, while the rear axle and front suspension are Triumph Mayflower units. With a maximum speed of 107 m.p.h., nearly 80 m.p.h. in third gear, a petrol consumption figure of 34 m.p.g., when driven hard, and a 0-60 acceleration figure of 12 sec., the TR2 is remarkable value at £900 including Purchase Tax. A special high speed version of the car attained a mean speed of 124 over the measured mile at Jabbeke in Belgium during the development period. Having seen Edgar Wadworth's privately owned TR2 average 74.71 for 1,793 miles at Le Mans last year, I expect great things from the Coventry pair this year.

There are two other major races in June, both World Championship events. Round 4, the Belgian Grand Prix, is on 5th June; Round 5, the Dutch Grand Prix, is on 19th June.

On the W.R. "Inter-City"—(Continued from page 250)

80 m.p.h. again approaching Denham Golf Club halt. Then came a gentle easing of the regulator and after the troughs at Ruislip the engine was opened up again to bring us rapidly to yet another flying junction.

This was Northolt, where the joint line that we had followed from Ashendon Junction comes to an end, the Marylebone line cutting across to Neasden and the Paddington line heading for its junction with the main Western line at Old Oak Common. So we came through Greenford and with brakes slightly on at Park Royal Signal Box we were already slowing when the A.T.C. warning siren once more gave its message. There is a restriction between Old Oak Lane and Old Oak Common West Junction, but green lights ushered us on to the real main line again and we cruised in past Westbourne Park, and on to Paddington.

There No. 11 platform was our berth and the brakes eased us before we whistled twice, and then applied the brakes again after the regulator had been opened and shut once more to bring us alongside the platform. Engineman Roden had more than kept his promise; the time was just 7.1 p.m.—we were four minutes early!

Stamp Collectors' Corner—(Continued from page 281)

"First Day" covers were prepared by the Australian Post Office, and these were postmarked at Macquarie Island, Heard Island and Mawson. The three covers are quite inexpensive, and they will set off a collection. The 3½d. stamp itself, with its map of the Antarctic and its frame of marine creatures, is very interesting. So if you cannot get the covers, a stamp will be available for a copper or two.

A Useful Reversing Mechanism—

(Continued from page 267)

lifts. A 1½" Pulley 19 is placed on Rod 18 and round it is passed a length of Cord, with each end tied to the base of one of the lifts. A second Cord is fastened at each end to a Spring bolted to the top of each lift, and is passed round a Pulley at the top of the tower.

It is preferable to allow a slight over-run so that the lifts reach the limits of their travel slightly before the reversing mechanism changes the direction of the drive. This is accomplished by a simple friction drive, which 'slips' when the lifts reach stops that prevent further movement. Instead of the Pulley 19 being fixed on Rod 18, it is mounted freely, and is pressed by a Compression Spring against a Motor Tyre 20 on a 1" Pulley fixed on the Rod.

The following is a list of the parts required to build the Motor unit and the automatic reversing mechanism: 1 of No. 3; 4 of No. 4; 2 of No. 9d; 2 of No. 15a; 1 of No. 15b; 3 of No. 16a; 1 of No. 17; 1 of No. 18a; 6 of No. 26; 1 of No. 26b; 5 of No. 27a; 2 of No. 31; 1 of No. 32; 21 of No. 37a; 12 of No. 37b; 10 of No. 38; 1 of No. 50; 2 of No. 53; 7 of No. 59; 1 of No. 62; 2 of No. 72; 1 of No. 94; 1 of No. 95; 2 of No. 96; 5 of No. 111c; 2 of No. 133; 1 E20R Electric Motor.

Among the Model-Builders—(Continued from page 269)

of 1" Triangular Plates 16 using Washers for spacing purposes. Now place the rocking member horizontally on a table with the Wheel Flange uppermost, and insert into the Wheel Flange a 1½" Pulley 8, with 22 steel balls ¼" dia. between the groove of the Pulley and the inner face of the Wheel Flange.

The assembly consisting of the rocking arm and the ball bearing is slipped on to the Rod 6 and held in place by a Collar; the Pulley 8 is clamped to the Rod. The rocking arm is guided at its upper end by two 2½" Strips bent as shown in the inset illustration in Fig. 3. Pivot Bolts connect these Strips to the rocking arm and the frame; the one at the top of the rocking arm has its threaded end outward.

The walking shoe is constructed from 9½" Angle Girders 24 and Strips 22, held together by 2" Angle Girders 27. The sides are 5½" Flat Girders 29, and the bottom is shaped from four 2½" Angle Girders 26 and two 4½" Angle Girders 25. The shoe pivot is a 1" Rod 7 held in Collars fixed to the Strips 22. A 2" Strip 23 strengthens the assembly.

A Meccano Fork Lift Truck—

(Continued from page 271)

Plate a Semi-Circular Plate 24 is fixed to Angle Brackets bolted to the sides and the back of the body. A 2½" Stepped Curved Strip and a 2½" Strip are bolted together and are supported by Angle Brackets fixed to each Semi-Circular Plate. A 1" Corner Bracket 25 on each side also is supported by an Angle Bracket.

Attach the body to the chassis by bolting the Flanged Plate 22 to the top ends of two slightly curved 1" Triangular Plates 26. At the rear two ½" Bolts 27 are fixed by nuts in the body, and each Bolt is held by two nuts in a Fishplate 28 bolted to the chassis.

A 3½" x 2½" Flanged Plate can be used as a pallet for the model as shown in Fig. 1.

Parts required to build the Fork Lift Truck: 2 of No. 1a; 1 of No. 2; 5 of No. 3; 6 of No. 4; 6 of No. 5; 5 of No. 6; 5 of No. 6a; 2 of No. 8b; 1 of No. 9c; 2 of No. 9d; 6 of No. 10; 4 of No. 11; 15 of No. 12; 4 of No. 12a; 2 of No. 12b; 1 of No. 15b; 4 of No. 16; 2 of No. 16a; 2 of No. 17; 2 of No. 20b; 2 of No. 21; 3 of No. 22; 1 of No. 24; 1 of No. 25; 2 of No. 26; 2 of No. 27a; 1 of No. 28; 9 of No. 35; 177 of No. 37a; 160 of No. 37b; 40 of No. 38; 2 of No. 38d; 1 of No. 40; 1 of No. 48b; 2 of No. 50; 1 of No. 103d; 2 of No. 111a; 4 of No. 111c; 1 of No. 124; 2 of No. 125; 1 of No. 126; 2 of No. 126a; 4 of No. 133a; 2 of No. 142d; 2 of No. 155; 1 of No. 160; 1 of No. 185; 1 of No. 186a; 3 of No. 188; 1 of No. 189; 3 of No. 191; 2 of No. 214; 4 of No. 215; 1 No. 1 Clockwork Motor.

Competitions! Open To All Readers

Prize-winning entries in M.M. competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

Which Would Be Your Greatest Thrill?

FROM time to time the world has been thrilled by some great, pioneering achievement—the first crossing of the North Atlantic ocean by air, the first flight round the world, the first successful expeditions to the North and South Poles, and so on. Although it may not fall to readers of the *M.M.* to accomplish anything so spectacular, no doubt there are lots of other thrilling things that they would like to do. We want to hear about them, and in this competition we give readers the opportunity of expressing their own opinions on the thrills they would like to experience.

Twelve experiences that undoubtedly would provide plenty of excitement are listed in the panel on this page. You will see that they cover a wide range, and include both experiences of the past and possible thrills of the future, and we are sure that all of you will find something

1. Piloting a jet 'plane through the sound barrier.
2. Building a giant bridge.
3. Visiting South Africa as a member of the British Rugby Union touring team.
4. Driving a car in the Monte Carlo Rally.
5. Entering the House of Commons as a member.
6. Appearing on Television.
7. Climbing Mount Everest.
8. Taking part in the Olympic Games.
9. Being Captain of the "Queen Mary."
10. Piloting the World's first Space Ship.
11. Making a footplate trip on "The Elizabethan."
12. Playing in a Test Cricket Match.

in the list in which he is specially interested.

Entrants in the contest are invited to do two things. The first is to say which of these experiences would give them the greatest thrill, and the second is to place the twelve experiences in the order of popularity in which they think the votes of competitors will put them.

Entries in this competition should be addressed *Greatest Thrill Contest, Meccano Magazine, Binns Road, Liverpool 13*. In it there will be two sections, for Home and Overseas readers respectively, and in each there will be prizes

to the value of 21/-, 15/- and 10/6. There will also be Consolation prizes for other deserving efforts, and in the event of a tie for any prize the judges will decide on the novelty and neatness of the entries.

The closing date in the Home Section is 30th June and in the Overseas Section 30th September.

Spring Photographic Contest

There is still time for readers who are amateur photographers to take part in the Spring Photographic Contest announced last month. In this we invite competitors to send us photographs that illustrate conditions or events of this season. Each competitor may submit only one photograph, which must have been taken by him, and on the back of his print must be stated exactly what the photograph represents; also his age must be given.

The Competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas sections, and in each section prizes of 21/-, 15/- and 10/6 will be awarded.

Entries should be addressed: *Spring Photographic Contest, Meccano Magazine,*

Binns Road, Liverpool 13. Closing dates: Home Section, 31st May; Overseas Section, 31st August.

Competitors who desire their entries to be returned should read carefully the paragraph at the top of this page.

Competition Results (Home)

JANUARY COVER VOTING CONTEST

1st Prize: J. Cuckney, Ramsgate. 2nd Prize: R. Bruce, Ashted. 3rd Prize: J. R. Carter, Doncaster. Consolation Prizes: M. Sykes, Wakefield, Yorks.; D. F. Wilks, Worcester; P. Sheldon, Kidderminster; M. Rayner, Bath; R. Searle, Bentham; T. Twigg, Epsom.

JANUARY LOCOMOTIVE NAMES CONTEST

1st Prize: I. Wright, Darlington. 2nd Prize: A. Winn, Bridgwater. 3rd Prize: W. McEwan, Consett. Consolation Prizes: C. C. Bailey, Redditch; M. Bryce, Motherwell; A. Barnes, Southsea; I. J. Smith, Old Hartford.

Fireside Fun

Four-year-old Mickey was at a picnic and spent a lot of the time in his sunsuit. A few days later dad overheard this:

Mother: "Here, Mickey, look in the mirror and see how you are peeling."

Mickey: "Gee, mom, only four years old and I'm wearing out already."

Diner: "I was here yesterday and had a steak."

Waiter: "Yes, sir; will you have the same today?"

Diner: "Well, I might as well, if no one else is using it."

After listening patiently to the first part of the orchestral concert, the little boy asked his father a question.

"What's that book the conductor is reading?"

"That's the score."

"Is it? Who's winning?"

A motorist was speeding along the road in his car. A policeman caught up with him and made him pull over to the side of the road.

"Why were you going so fast?" asked the policeman.

"My brakes are bad and I was hurrying home before I had an accident," replied the driver.

"Grandmother," said little Tommy, "do your glasses make things look bigger than they really are?"

"Yes, they do," replied his grandmother.

"Well, then, will you please take them off when you cut my next piece of pie?"

Prof.: "Why don't you answer me?"

Smart Alec: "I did, professor, I shook my head."

Prof.: "You don't expect me to hear it rattle way up here do you?"

BRAIN TEASERS

A GAME WITH COINS

Draw a square and then divide it into 25 smaller squares as shown in the diagram alongside.

Now put coins in the nine central squares. The problem is to try to get rid of all the coins except one by "jumping" or "huffing" as in the game of draughts. You may jump vertically, horizontally or diagonally, taking care to remove each coin you jump over. You must, however, leave the last coin in the centre square.

	1	8	7	
	2	9	6	
	3	4	5	

HOLIDAY WITH AUNTY

Six boys are going to spend Whitsuntide with their Aunts who live in six different towns. Can you find, with the aid of the clues given below, to which town each boy is going?

Jack is going to: A number of trees.

Peter is going to: A rocky pinnacle and a wharf

Michael is going to: Part of a ship.

James is going to: A bird and a body of water.

John is going to: The opposite of war and a place of safety.

David is going to: A freshly made landing place.

WHAT WAS THE DATE?

Workmen engaged in a reconstruction scheme on a large building, had to remove temporarily the original foundation stone, which bore the date of erection. Unfortunately in replacing the stone they laid it upside down, yet nobody noticed the mistake. What was the date on the stone?

SOLUTIONS

TO LAST MONTH'S PUZZLES

Hidden Phrase

The complete phrase referred to in this puzzle is "In Town Tonight."

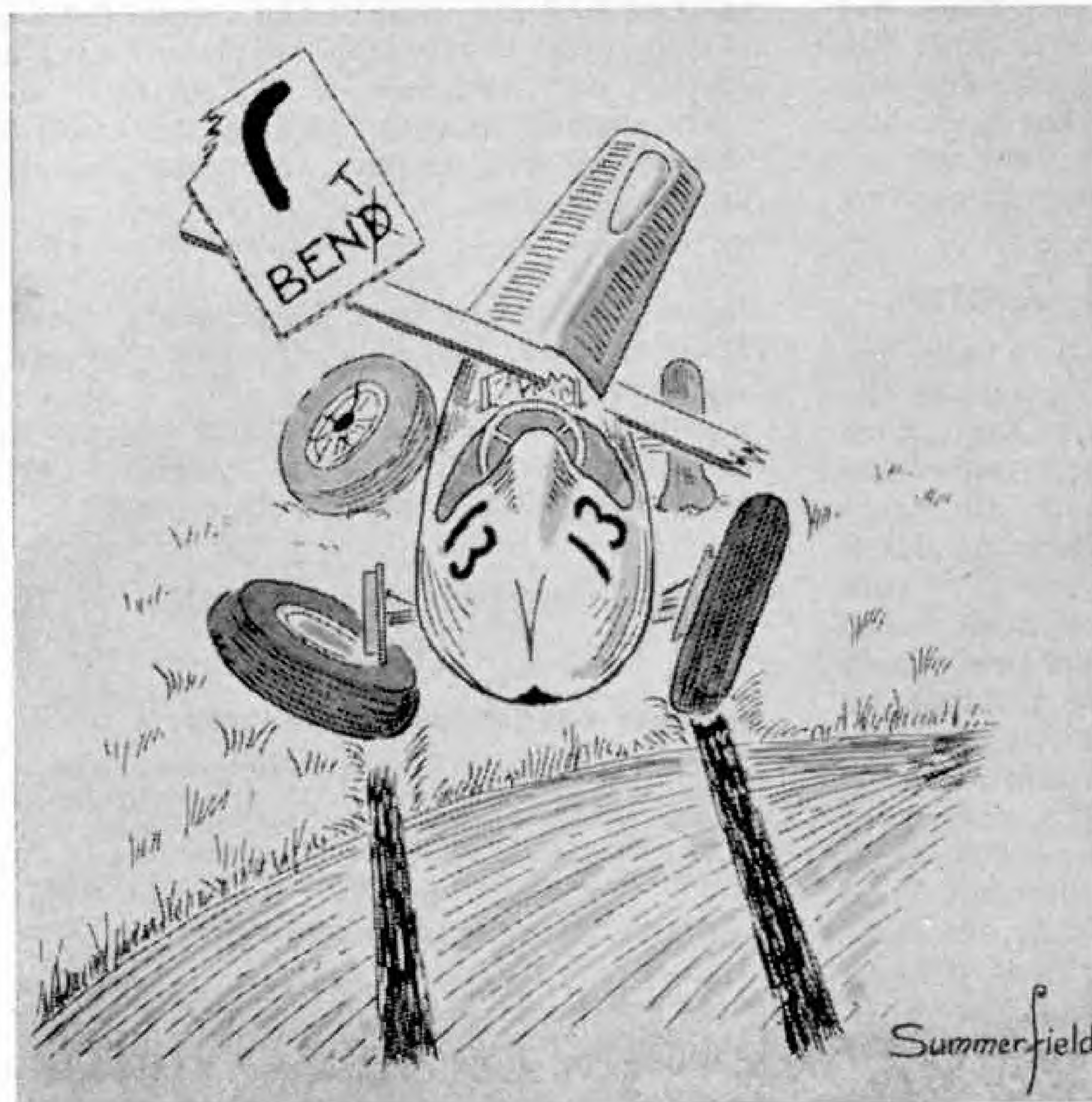
Birds' Names

The names of the birds indicated by the clues given are: (1) Swallow, (2) Heron, (3) Wren, (4) Moorhen, (5) Robin, (6) Stork.

Five-minute Crossword

The solution to the Five-Minute Crossword is shown below.

1	A	2	L	3	I	4	V	5	E
6	R	7	O	8		9	I	10	A
11	M	12	O	13	A	14	T	15	S
16	E	17	S	18		19	A	20	E
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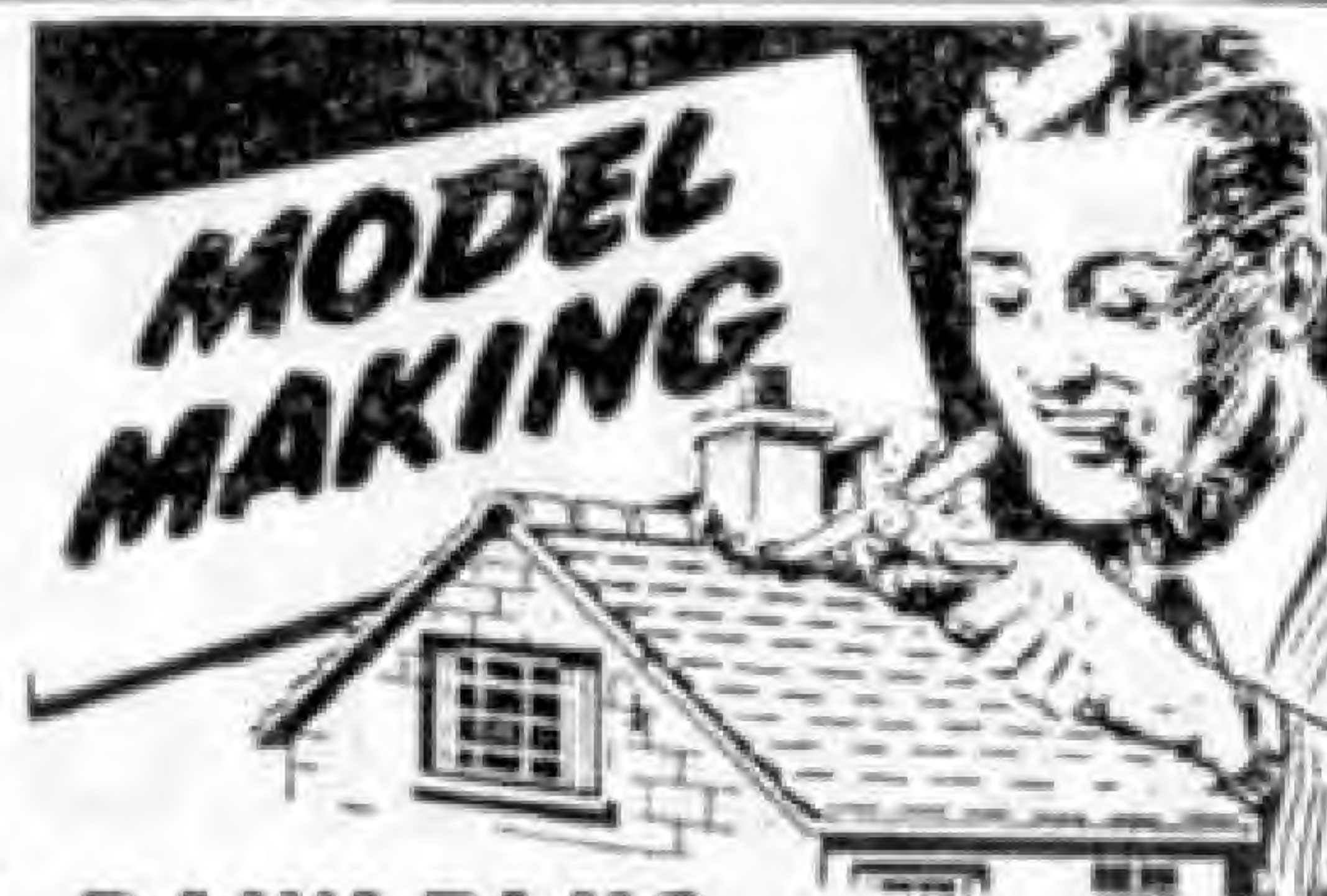
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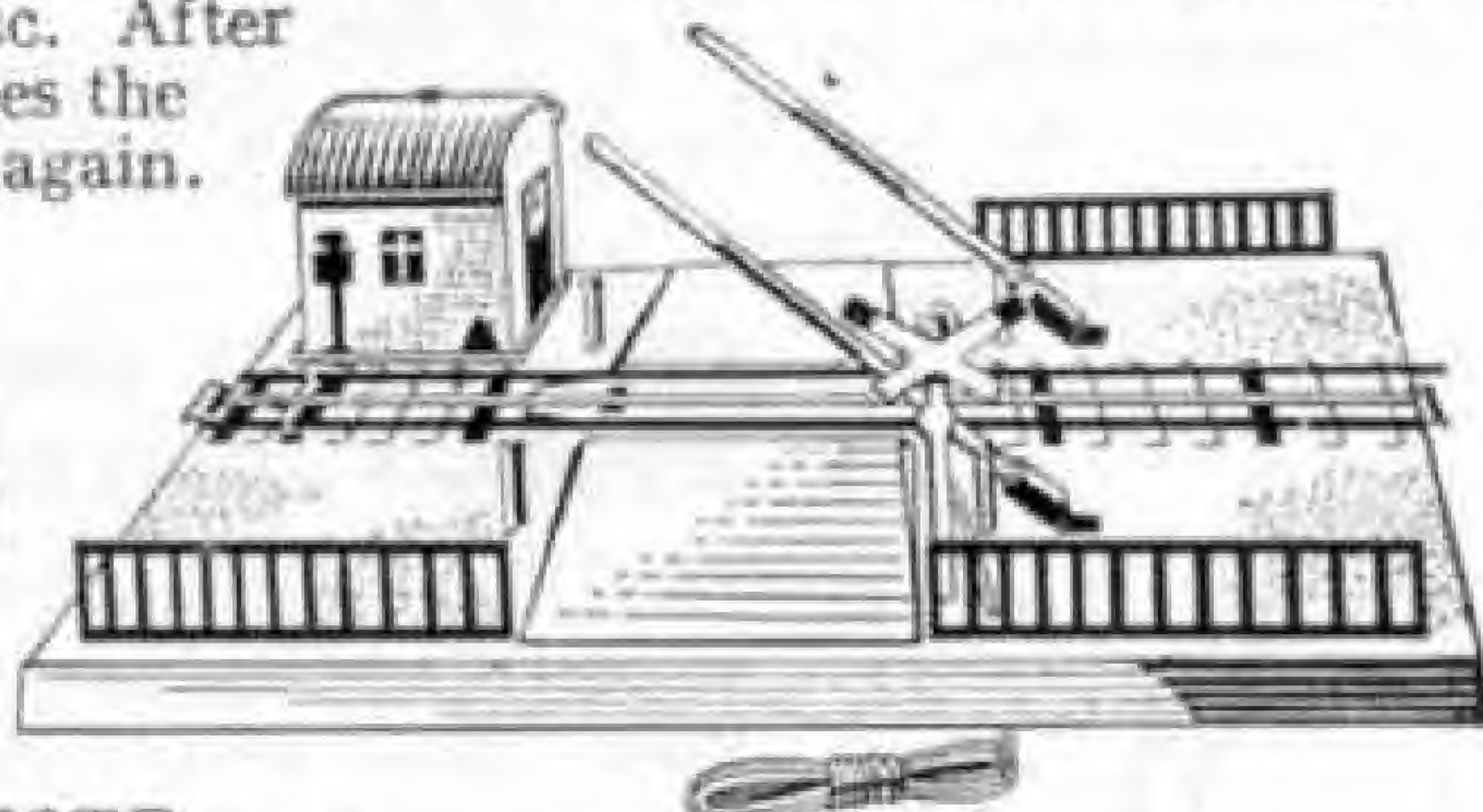
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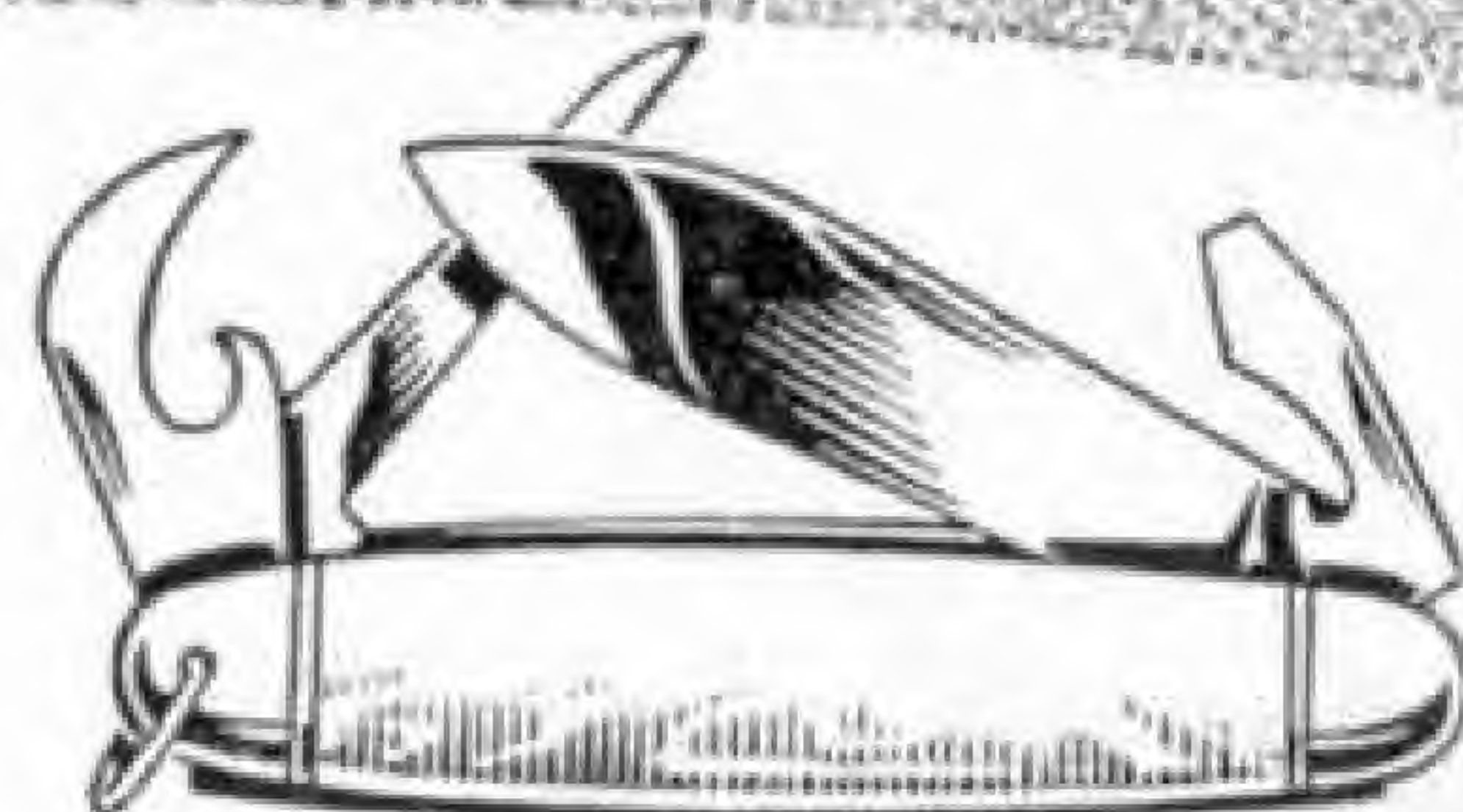
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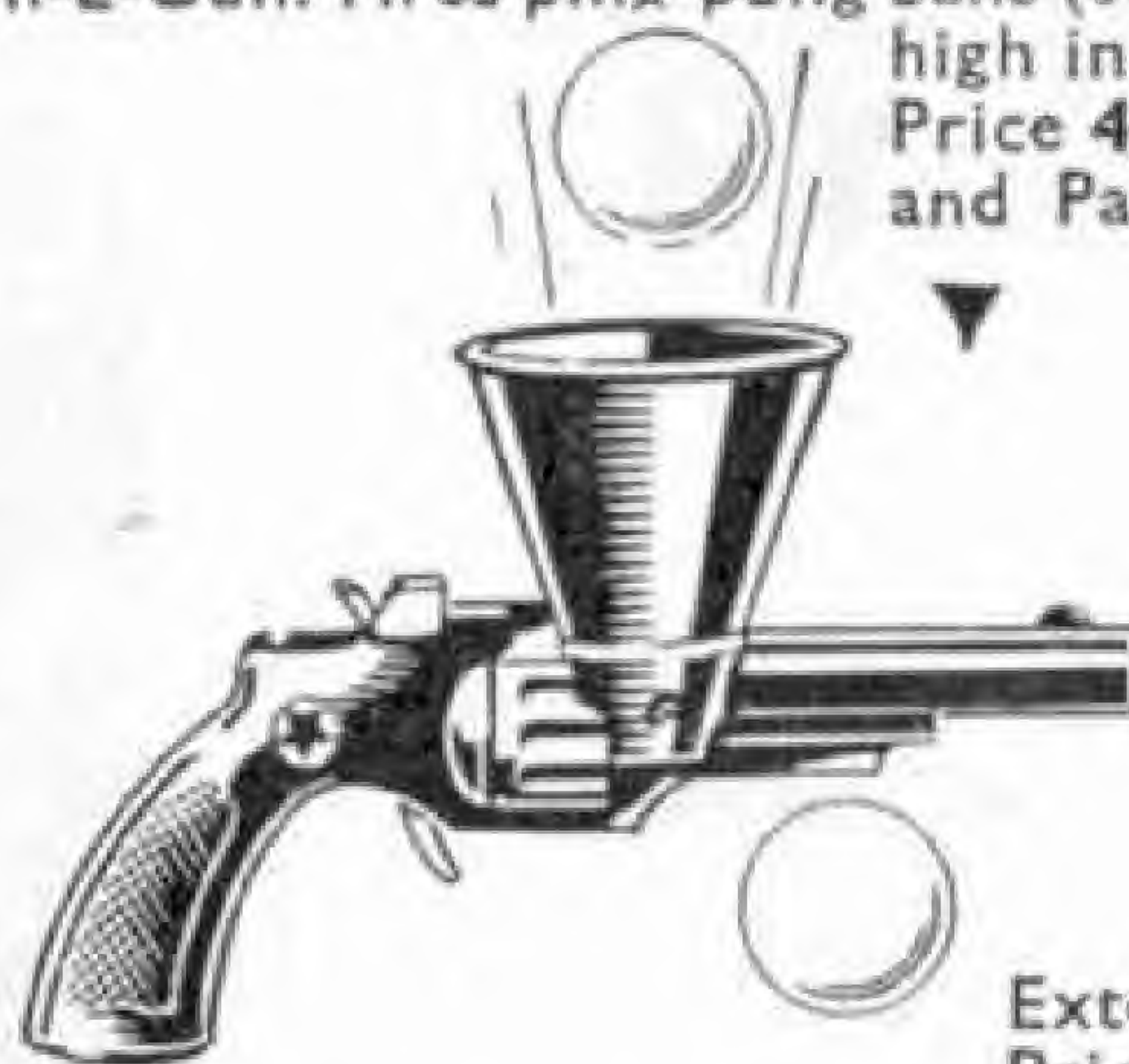


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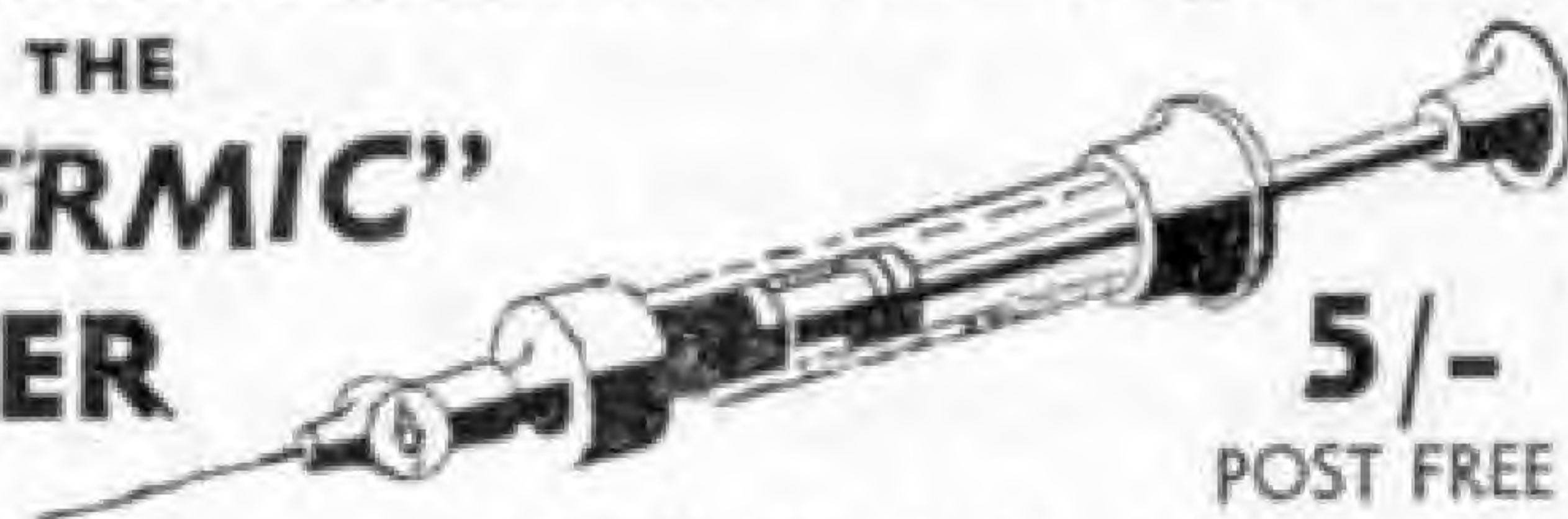
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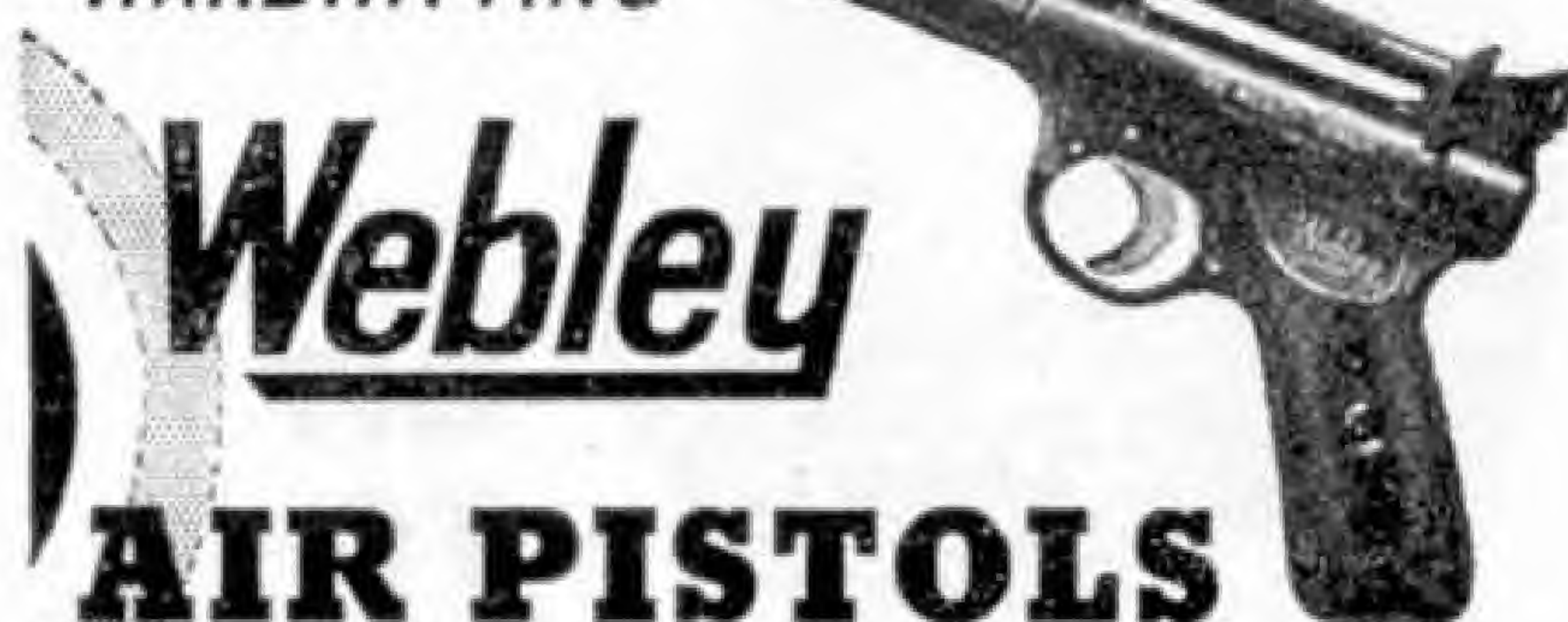
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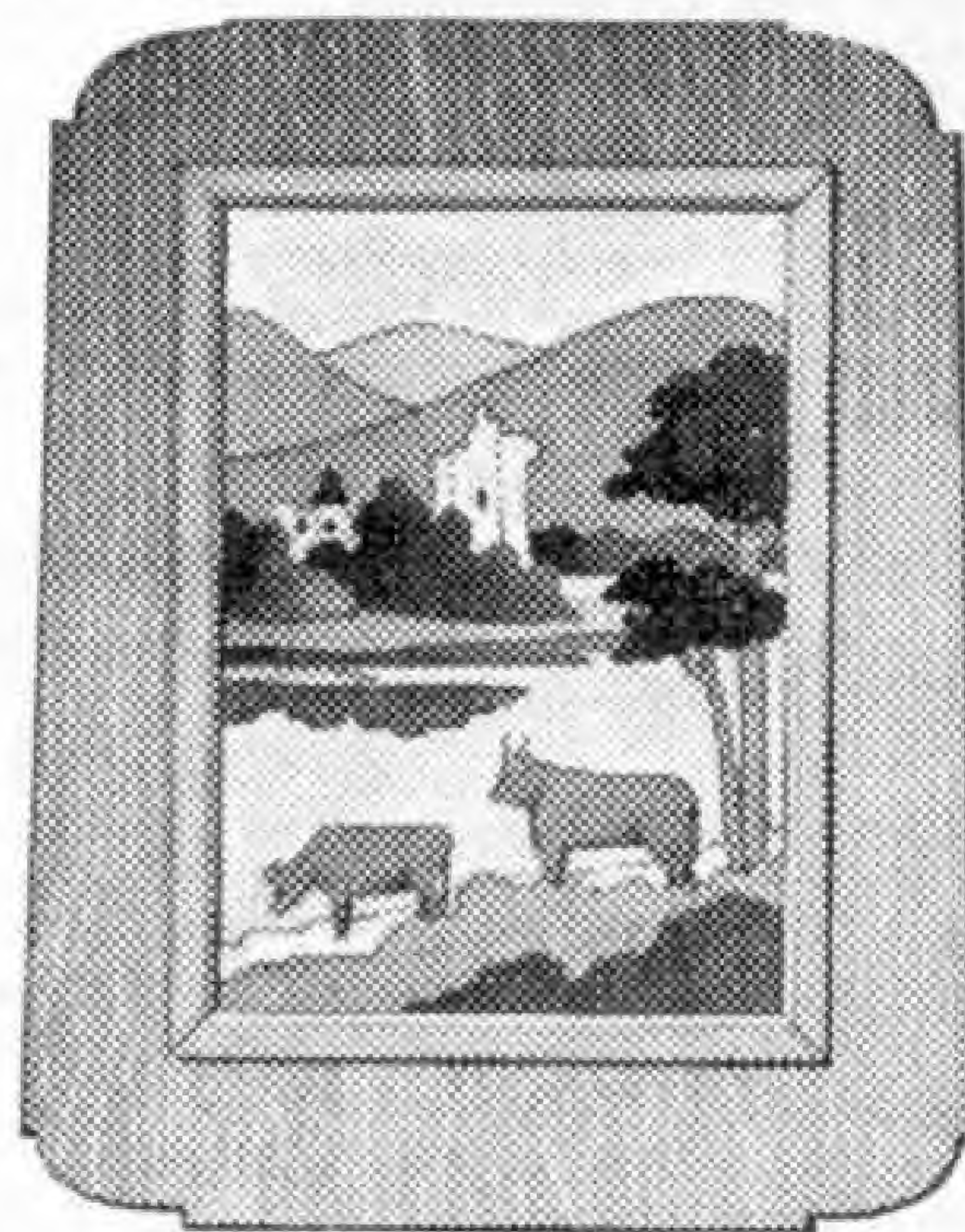
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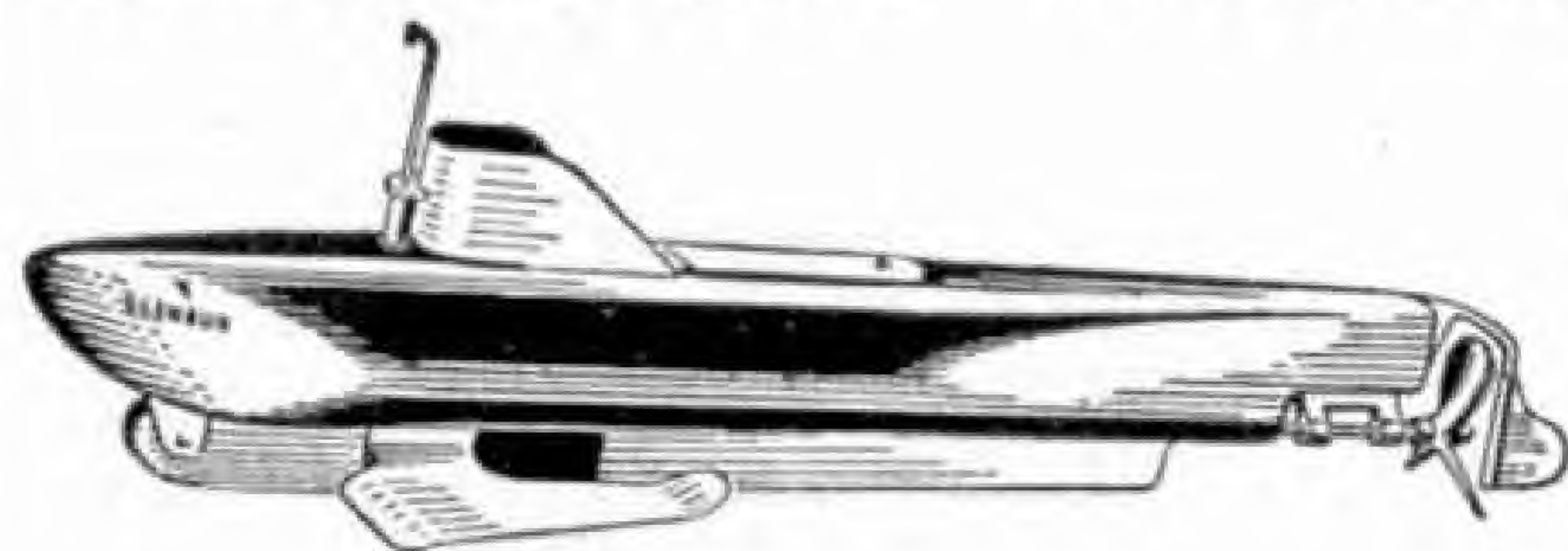
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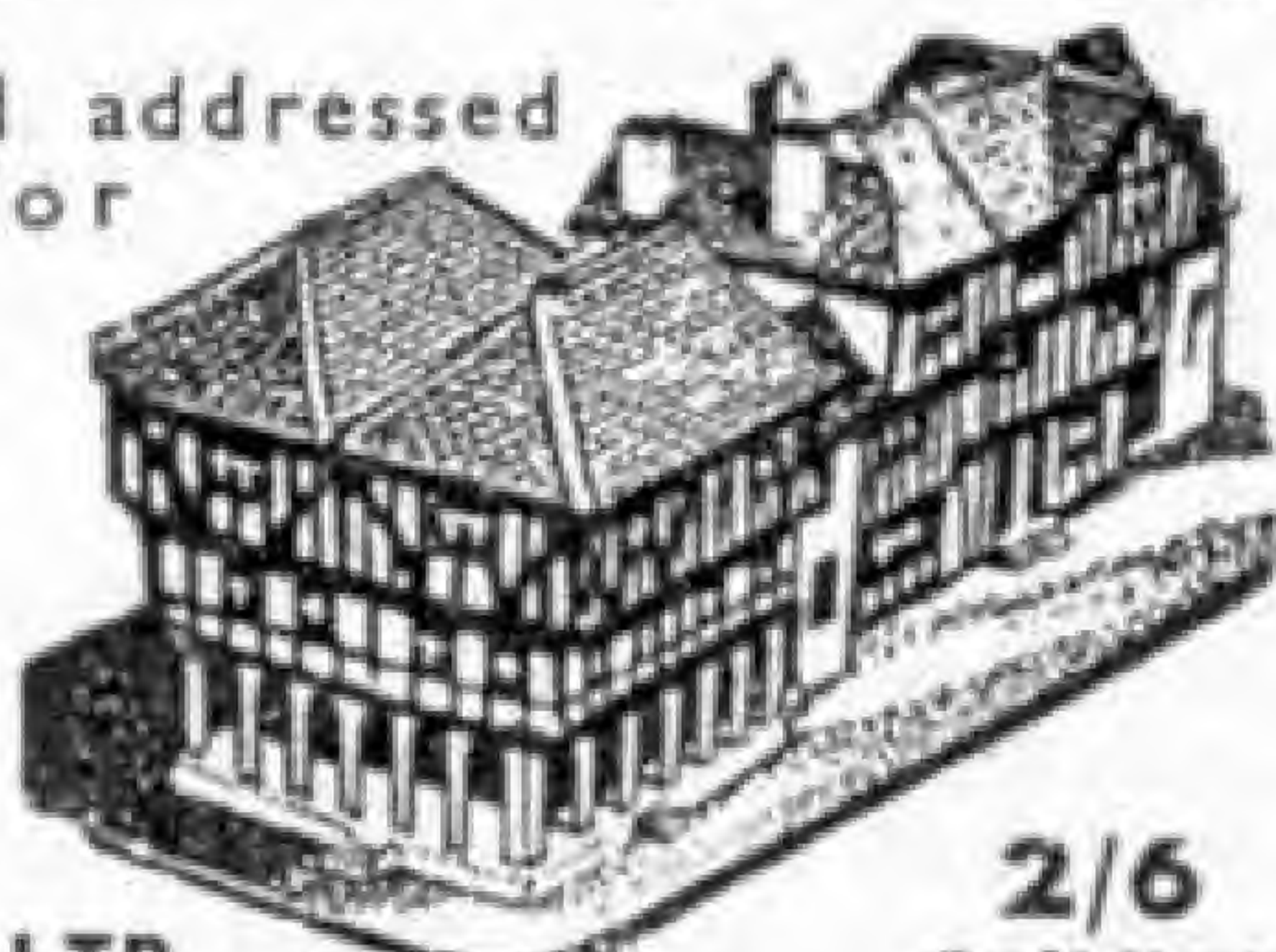
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